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Agricultural Income and Finance

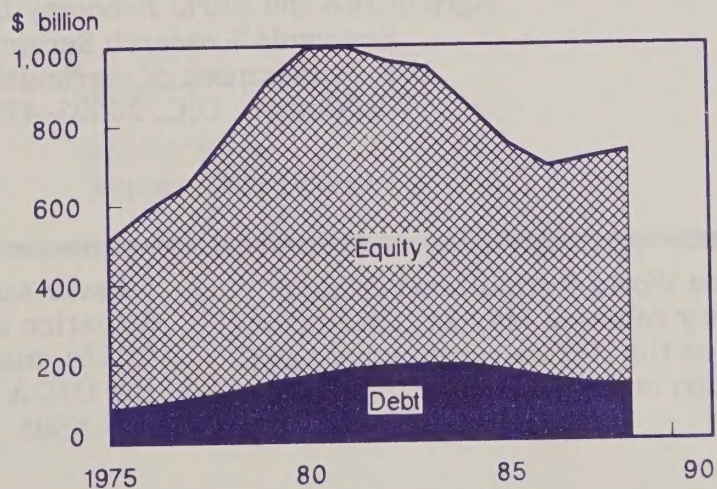
Situation and Outlook Report

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SEP 2 1988

Farm Equity Up Again in 1988



1987 and 1988 forecast.

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Approved by the World Agricultural Outlook Board. Summary released May 24, 1988. The next summary of the *Agricultural Income and Finance Situation and Outlook* is scheduled for

release August 30. Summaries and full Situation and Outlook reports, including tables, may be accessed electronically through the USDA EDI system. For details, call (202) 447-5505.

ABOUT THE NEW REPORT...

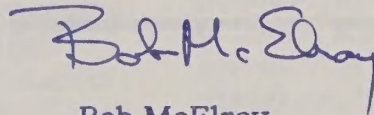
This issue of *Agricultural Income and Finance Situation and Outlook* (formerly titled *Agricultural Finance Situation and Outlook*) is the first in ERS' expanded quarterly reports on the financial situation of U.S. agriculture. Along with core analysis and data, we plan to give each issue its own unique focus. This issue incorporates many data just available as planting season finishes for most crops. The section on farm assets incorporates the most recent land value data just released in April. Costs of production for 1988 crops are also featured, as is a special article on new estimating procedures being tested.

The September issue will have a dual focus. Analysis from the annual Farm Costs and Returns Survey will be featured as will the first preliminary estimates, rather than forecasts, of farm financial indicators. In December USDA holds its annual Outlook Conference and the December issue will include the first outlook for the coming year.

The March issue, previously published annually as *Agricultural Finance*, will continue to be coordinated by ERS' Finance and Tax Branch. The focus, as in the past, will be on agricultural lenders.

Initial plans to expand to a quarterly report began two years ago as ERS recognized the public's interest in more current financial information. As coordinator for three of the four issues, I have tried to choose articles and to emphasize a focus providing the most up-to-date information available. I invite your comments as reader and data user so *Agricultural Income and Finance* can best serve your interests.

Beginning with the September issue, *Agricultural Income and Finance* will be available on subscription at a price still to be determined. I will have details shortly.



Bob McElroy
Report Coordinator

GLOSSARY OF TERMS IN FARM INCOME AND FINANCE

Net cash income--is the difference between cash receipts and cash expenses. This cash-based concept measures the total income farmers receive in a given year, regardless of the year in which the marketed output was produced. It indicates the availability of funds to cover cash operating costs, finance capital investments and savings, service debts, maintain living standards, and pay taxes.

Net farm income---is the difference between gross farm income and total expenses. This accrual-based concept measures the profit or loss associated with a given year's production. Additions to inventories are treated as income. Nonmoney items such as depreciation, the consumption of farm-grown food, and the net imputed rental value of operator dwellings are included.

Net cash flow--is the sum of: gross cash income, the change in loans outstanding, net rent to nonoperator landlords, and the net change in farmers' currency and demand deposits; minus gross cash expenses and gross capital expenditures. This financial indicator measures cash available to farm operators and landlords in a given year. It indicates the ability to meet current obligations and provide for family living expenses, and to undertake investments.

Current and inflation-adjusted dollars--In this report, dollar values of income, expense, asset, and debt items, unadjusted for the effects of inflation, are referred to as current or nominal dollars. Current or nominal figures, which indicate the purchasing power prevailing in the cited year, do not allow for fully accurate comparisons across time. To allow for meaningful comparisons across time, adjustments for the effects of inflation are made. Adjusted figures use a 1982 base and are interchangeably referred to as real, constant dollar, or inflation-adjusted.

SUMMARY

Financial Performance of U.S. Agriculture Remains Strong

Net cash income is forecast at \$50–55 billion for 1988, down from 1987's record. Net farm income, on the other hand, should remain between \$40 and \$45 billion, unchanged from 1987. Underlying these forecasts are improvements in several of agriculture's key fundamentals:

- o Increased use and lower stocks of most major program commodities;
- o Market prices approaching or exceeding loan rates;
- o Higher cattle and calf prices offsetting minor declines in production;
- o Continued moderate interest rates; and
- o Continued gains in the financial position of farmers and ranchers with total farm debt falling for the fifth consecutive year.

Total cash receipts may range from \$138 to \$142 billion, with improved crop receipts. Food grains and soybeans should lead the way among crops. Livestock receipts are forecast to remain stable. Cattle and calf prices are relatively high, but hog prices are off, and dairy earnings are likely to fall substantially.

Production expenses are expected to rise, after declining at an unprecedented rate the last 3 years. Those expenses that will have the most impact include variable inputs and feed, although the effects will vary depending on farm type and region. Spring fertilizer prices were up 10 percent from a year earlier. High fertilizer prices will be felt most by corn and barley producers, whose outlays for fertilizer make up 38 and 30 percent, respectively, of variable costs. The Corn Belt will be the region most affected.

Energy expenses may increase roughly 5 percent. Cash grain and cattle and hog operations accounted for over 60 percent of total 1987 fuel expenses, so the Corn Belt should again be the region most affected.

The drop in 1988 net cash income will be due mainly to higher forecast cash expenses outweighing increased receipts. Contributing to the decline in income is a projected 15– to

20–percent drop in direct government payments.

The decline in earnings to livestock farms will be distributed unevenly among the different livestock farm types. The ratio of crop receipts to livestock receipts is particularly important, especially when comparing regions. In the Southeast, with a crop/livestock receipts ratio of nearly one to one, net cash income will likely fare better than in the other major farm production regions.

The farming sector's balance sheet shows continued improvement with rising real estate values and declining debt levels. With improving income, lower debt, and adequate credit for farm real estate loans, buyers are coming back into the real estate market. With recent improvements in cash flow, many land sales have been for cash.

After a continuous downturn since 1982, agricultural assets rose an estimated 3 percent in 1987 and are projected to rise 2 percent to \$725–735 billion this year. Most of the rise is coming from increasing farm real estate values. During 1987, farm real estate values rose an average 7 percent in the Northern Plains and Lake States and 9 percent in the Corn Belt.

Nonreal estate values increased an estimated 5 percent in 1987 due primarily to a \$10–billion rise in the value of livestock and poultry. Animal inventory values are expected to climb another 3 percent in 1988 while crop inventories could fall 16 percent with a drawdown in stocks.

Debt levels are falling. From an annual decrease of 11.6 percent in 1986, 8 percent in 1987, and an estimated 4 percent in 1988, the drop is slowing due in part to lender efforts to restructure problem loans rather than foreclose. Real estate debt should fall 3–4 percent this year and nonreal estate, 5 percent.

The market share of total debt by lenders has been changing. Last year commercial banks passed the Farm Credit System as the principal holder of farm debt. The System's market share declined from 34 percent in 1982 to 27.5 percent in 1987. Meantime, debt held

by commercial banks rose from 22.1 percent to 28.4 percent. Federal Land Banks also experienced a loss in market share, but continue to be the principal source of real estate credit.

The rate of return on farm assets from current income was 5.5 percent in 1987 and should average around 5 percent in 1988. The rates of return on equity increased to 4.3 percent in 1987 but may decline slightly in 1988.

FARM INCOME

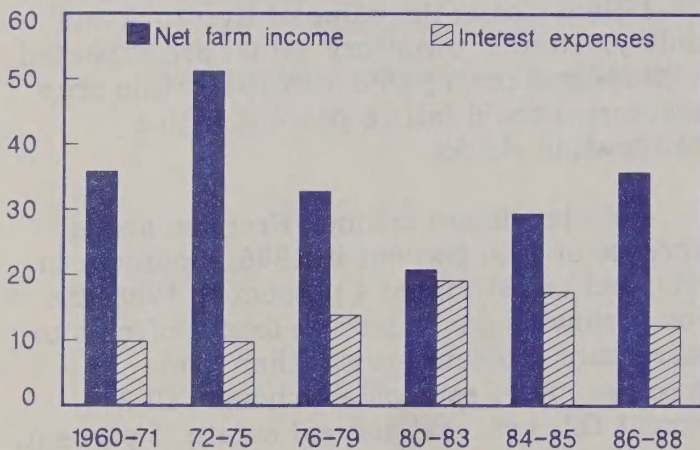
1988 Outlook

The farm sector's income and financial performance should remain strong in 1988 with net farm income about equalling the 1987 record. Net cash and net farm incomes are currently forecast at \$50 to \$55 billion and \$40 to \$45 billion, respectively. In nominal terms, both measures may be the second highest on record. Substantial gains made in weathering the debt crisis in agriculture support the prospect of a sustained financial recovery. From a high of nearly \$193 billion in 1983, total farm debt in 1988 is forecast at \$132 to \$142 billion. Interest charges corresponding to this moderating debt level may decline another \$1 billion in 1988.

Figure 1

Recent Improvement in Farm Income and Interest Expenses

\$ 1982 billion



1986-88 forecast.

Income and Financial Recovery

Recent gains in the level of farm earnings are best put in perspective with a brief historical background. Adjusted for inflation, the 1986-88 projected level of net farm income should equal or exceed the stable 1960-71 average. The return of real 1988 farm income to the 1960-71 average masks considerable variability. The farm sector experienced tremendous growth and optimism during much of the 1970's before encountering a pronounced downturn in the early- and mid-1980's. Following the early 1980's farm recession and the 1984-85 transition periods, higher profitability levels and large debt reductions have been sustained since 1986.

Interest expenses have also undergone wide swings over the last decade and a half. After averaging just under \$10 billion per year (adjusted for inflation) throughout the 1960's, annual interest charges rose to \$26 billion during the expansionary late-1970's and recessionary early-1980's. An indicator of agriculture's turnaround over the past few years is the fact that inflation-adjusted net farm income in 1986-88 may exceed the 1960-71 average despite higher, though receding, debt service obligations. Although financial stress continues in particular regions, among some farm types, or among many highly leveraged operations, the farm sector's financial position now roughly parallels that of the 1960's.

Total gross income in 1988 is projected to slightly exceed the year-earlier level. At \$166 to \$171 billion, total gross income would trail only the 1984 record, established in the wake of the 1983 PIK and drought year. Although a slight increase, this year-over-year gain is significant given an anticipated \$1- to \$2-billion drop in livestock receipts and a \$3- to \$4-billion decline in direct Federal supports. Federal payments as a share of total gross farm income are projected to fall from a high of 10 percent in 1987 to 8 percent this year as market prices for program commodities strengthen. As indicated in figure 2, direct supports to agriculture are expected to fall at least 20 percent in 1988.

Net farm income is virtually unchanged from 1987, despite lower direct Federal subsidies, an expected 2- to 3-percent rise in production expenditures, and a possible modest downturn in livestock receipts. Higher priced manufactured inputs, increased input use, and rising feed costs underlie much of the anticipated increase in operating costs. Higher costs for these items will likely outweigh the reduction in debt service and depreciation charges.

Underlying the stability that characterizes the 1988 farm income forecast are substantial improvements in several of agriculture's key fundamentals. Among these are:

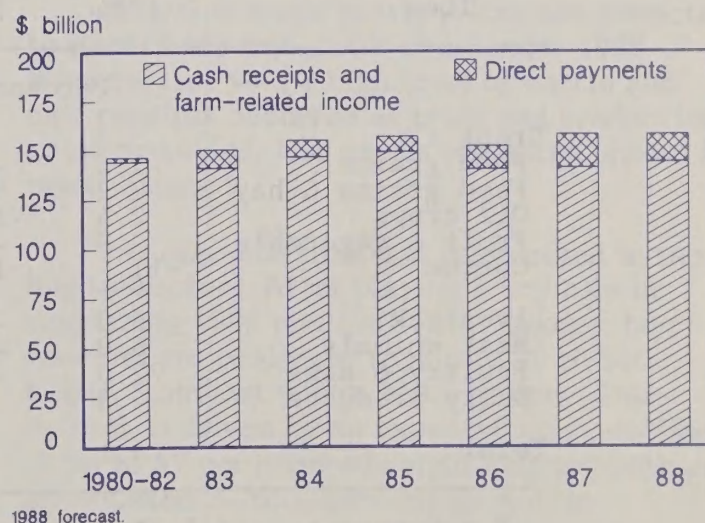
- o A roughly 10-percent increase in utilization of major program commodities should improve crop prices and gross earnings.
- o Planting intentions for wheat, corn, and soybeans indicate that acreage of these three crops may increase by less than 1 percent over 1987, a small enough increase to enable continued stock reductions.
- o In contrast to 1985 and 1986 when nearly one-fourth of total crop marketings went through the CCC, net withdrawals from the CCC are projected for 1988.
- o Although lower, Federal payments will likely provide \$13 to \$15 billion to gross farm earnings, the second highest on record.

- o A 4-percent increase in cattle prices, more than offsetting slightly lower production, is likely to result in record cattle receipts.
- o Interest expenses may fall as much as \$1 billion to between \$13 and \$15 billion as total debt continues to moderate.
- o Net withdrawals from the CCC (redemptions larger than placements) are expected this year. Thus, open market sales may account for 100 percent of total program commodity receipts. In contrast, net placements in 1985 and 1986 averaged roughly \$10 billion annually, nearly 25 percent of total commodity program cash receipts each year.

Perhaps the most important factor supporting the continued high level of net farm income for 1988 is a projected \$2- to \$6-billion gain in crop receipts. Increasing crop receipts are in large part the result of a projected 10-percent gain in U.S. agricultural exports. With direct Federal payments remaining at a relatively high level, total gross income is projected to rise for the second consecutive year. As indicated in figure 2, combined crop and livestock cash receipts will play a larger role in gross earnings with the relative position of direct government payments declining.

Despite an expected upturn in capital expenditures and the continued use of farm

Figure 2
Gross Cash Income



receipts to pay down farm debt, 1988 net cash flow is projected to set a new high of \$45 to \$50 billion. The projected high level of cash availability will help sustain momentum in reducing the farm sector's debt burden. Also contributing to the ability of producers to cover operating costs without increasing the level of production loans is the continuation of substantial acreage reductions for the 1988/89 crop year. Planted acres of the eight major program commodities may fall 15 percent below the 1984 level. Over the last 4 years, land set-asides under the acreage reduction and paid land diversion programs have helped decrease the need to use credit to finance production inputs.

CASH RECEIPTS

After falling sharply in 1986 and remaining flat last year, total crop and livestock cash receipts are expected to rise 2 percent to \$138 to \$142 billion in 1988. The \$3- to \$5-billion growth in crop receipts, due to higher market prices, recovering exports, and much lower stocks, will help boost the 1988 index of prices received for all crops 6 percent above a year ago.

Rebounding foreign purchases of U.S. farm products (in part due to an increase in export subsidies) have played a key role in fostering both more manageable stock levels

and an improved outlook for crop receipts. Fiscal 1988 export tonnage is anticipated to be 30 percent above the 12-year low set in 1986. Higher volume, along with increased prices may lead to the second consecutive gain in export values following 5 straight years of decline. Reduced loan rates, which lowered the price floor for program commodities, in conjunction with the lower foreign exchange value of the dollar have boosted U.S. market shares of world agricultural trade.

In crop year 1988/89, food grain stocks are expected to be one-third below a year earlier with wheat and wheat flour exports accounting for much of the reduction. Strong demand from the livestock sector is supporting feed grain receipts. Demand for feed by livestock operators should continue to strengthen feed grain prices in 1988 due to increases in pork and poultry production.

Food Grains and Soybeans Lead Turnaround in Crop Receipts

The projected 7-percent growth in crop receipts relative to the year earlier would place crop receipts nearly \$2 billion above the 1986 level, reversing 2 successive years of decline. Gross earnings from soybeans are projected to provide the single largest increase. Keyed by a 20-percent increase in the calendar year price, soybean receipts may return to their 1986 level. In addition to higher prices, prospects for the recovery in

Table 1--Cash receipts, 1984-88

| Item | 1984 | 1985 | 1986 | 1987F | 1988F |
|-------------------|------------------------------------|-------|------|-------|-------|
| | Percent change from a year earlier | | | | |
| Crops 1/ | 3.3 | 5.0 | -15 | -4 | 7 |
| Food grains | -1.6 | -7.6 | -35 | -6 | 18 |
| Feed grains & hay | 2.3 | 36.0 | -21 | -27 | -4 |
| Oil crops | 2.4 | -11.7 | -17 | 2 | 19 |
| Fruit & vegetable | 9.9 | -3.9 | 1 | 4 | 1 |
| Cotton | -11 | 12 | -22 | 35 | 23 |
| Livestock | 5.0 | -4.8 | 1 | 11 | -1 |
| Meat animals | 6.9 | -6.5 | 0 | 13 | 1 |
| Poultry & eggs | 22.0 | -8.2 | 13 | -9 | 0 |
| Dairy products | -4.8 | 1.1 | -1 | 1 | -5 |
| Total | 4.1 | 1.3 | -6 | 0 | 2 |

F = Forecast. 1/ Includes net CCC loans.

soybean revenues are supported by stable planted acreage and output and by a reduction in beginning stocks of about one-third from a year ago.

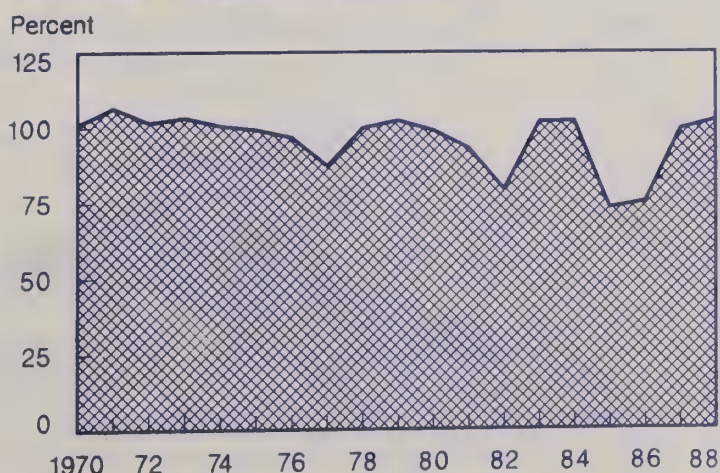
Food grains are expected to provide an additional \$1.3 billion to 1988 crop receipts. Crop year 1988/89 prices for wheat and rice are projected to rise an average 15 percent. These price movements, along with an increased reliance on open market sales, suggest a recovering food grain subsector.

Due to a widening gap between market prices and the CCC loan rate, net redemptions of wheat and rice are expected to exceed \$500 million for the second straight year. Generic certificates also continue to play a role in spurring the redemption of government-owned stocks. Last year total PIK issuances were valued at \$10 billion. The 1988 level is forecast in the vicinity of \$6 to \$8 billion.

Despite strong prices, higher exports, and reduced stocks, feed grain receipts may decline 4 percent in 1988 due to a lower volume of calendar 1988 marketings. Lower marketings result from using a combination of the current and previous year's production. High production levels for both corn and sorghum in 1986 were not maintained in 1987 as roughly 14 million additional acres were idled. Hence, the projected decline in calendar 1988 feed grain receipts is due to a drop in 1987 production relative to 1986.

Figure 3

Open Market Sales as a Percent of Crop Receipts, Program Commodities



1988 forecast. Includes cash receipts net of CCC loans for food and feed grains less hay, soybeans, and cotton.

Cotton is also contributing to the improved crop receipts outlook as production remains near last year's record, and calendar year marketings boost receipts by roughly \$1 billion. Cotton receipts are projected at \$4 to \$6 billion, up 25 percent from the previous high in 1987. Part of the projected growth in 1988 cotton receipts is based on an increased reliance on CCC price support loans. A larger CCC role is evident as, after a \$600-million net withdrawal last year, net loan placements of cotton may reach \$200 million in 1988.

Record Cattle and Calf Revenues

Livestock receipts are projected stable in 1988, about equalling last year's record \$75 billion. Continued high total livestock receipts are due principally to strong cattle and calf prices, the continued pork expansion, and growth in poultry and egg revenues. Forecast at \$31 to \$37 billion, cattle and calf receipts are second only to the 1979 record, despite a 2- to 3-percent decline in production. The livestock commodity group facing the largest prospective earnings decline is dairy. With milk production forecast at a near-record level, the 1988 dairy support price has been reduced 50 cents per hundredweight, dampening the outlook for this year's receipts.

Whereas the livestock sector supported record income and cash flow levels during 1985-87, the same is not expected in 1988. From 1985 to 1987 livestock receipts rose nearly \$5 billion, while crop receipts fell more than \$13 billion. Net income accruing to livestock operators is also likely to be down because of higher feed costs.

Annual average cattle prices are expected to exceed the mid-\$60's in calendar 1988. Whereas last year's high level of cattle and calf receipts occurred as price and production gains coincided, this year's projected upturn is price-induced.

The opposite situation is expected in the hog subsector. After playing a key role in supporting 1986 and 1987 farm income, hog receipts are projected to slip to \$9 to \$10 billion from last year's \$10.1 billion. This outlook is driven by an expected price decline of \$6 to \$7 per hundredweight coupled with an anticipated 5- to 6-percent growth in production. Although prices remained strong

in the first quarter of 1988 and have further strengthened in early summer, net hog margins declined considerably due to higher feed grain prices.

FEDERAL PAYMENTS

Improved Crops Outlook Compensates for Lower Federal Supports

After reaching a record \$17 billion in 1987, direct Federal payments are projected to decline to \$13 to \$15 billion this year through legislatively lowered price support levels and higher market prices. Also contributing to the decreasing Federal supports are the possibilities of lower participation rates in both acreage reduction and voluntary paid land diversion programs.

This year's rice program participation rate is expected to decline roughly 10 percent. Participation in the wheat program should fall 4 percent, while among corn producers, primarily in the Midwest, participation is expected to decline 2 to 3 percent.

An over \$2-billion reduction in certificate issuances plus a possible \$400- to \$500-million decline in cash deficiency outlays account for the bulk of the expected decline in direct government payments. Even though direct payments to farmers may decline 20 percent

in 1988, they retain a very significant role in supporting the income and financial positions of grain and cotton producers in particular, and the agricultural sector in general.

PRODUCTION EXPENSES

Total Expenses Expected To Rise in 1988

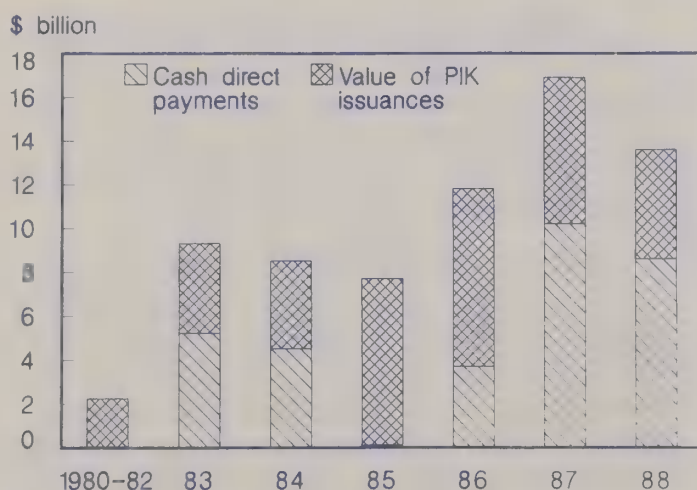
The outlook for production expenses is for a \$1- to \$4-billion rise in 1988 after declining at an unprecedented rate from 1985 through 1987. Tight control of operating costs continues to be essential for producers to sustain recent income gains.

Expense components that will likely raise this year's production costs include fertilizer, feed, and interest charges. Spring fertilizer prices are showing a 10-percent increase over the year earlier. Nitrogen prices may increase the most, implying higher production costs for corn producers. Higher fertilizer prices, reductions in corn and sorghum paid land diversion requirements, and lower acreage reduction requirements for rice and cotton could increase fertilizer expenditures by 10 to 12 percent. Even this increase would remain substantially below the 1985 level.

Corn acreage is expected to increase 1 to 1.2 million acres in 1988, in part due to a one-third reduction in the minimum diversion

Figure 4

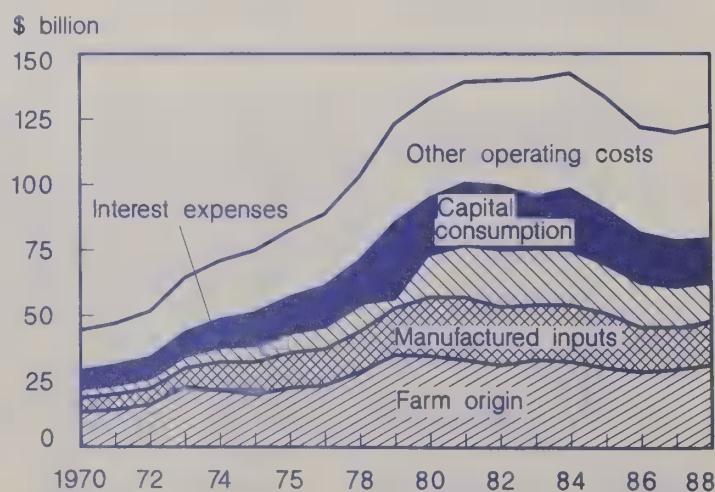
Direct Government Payments: Cash and PIK



1988 forecast

Figure 5

Farm Production Expenses



1988 forecast

Table 2--Farm production expenses, 1984-88

| Item | 1984 | 1985 | 1986 | 1987F | 1988F |
|------------------------------------|------|-------|------|-------|-------|
| Percent change from a year earlier | | | | | |
| Farm origin items | -2.1 | -2.4 | -5 | 3 | 5 |
| Manufactured inputs | 2.8 | 3.3 | -18 | -6 | 6 |
| Interest charges | -1.4 | -11.4 | -9 | -9 | -5 |
| Repairs, labor, and machine hire | 1.1 | 0.5 | -3 | 3 | 4 |
| Capital consumption | 3.4 | 9.6 | -9 | -8 | -5 |
| Total expenses | 1.6 | -6.4 | -9 | -2 | 2 |
| Cash expenses | 2.6 | -5.8 | -9 | -1 | 4 |

F = Forecast.

requirement for participation in the paid land diversion program. Higher corn production in conjunction with the expected fertilizer price increase may boost fertilizer expenditures by \$600 million. The Corn Belt, which typically accounts for around 30 percent of total fertilizer expenditures, will be the region most affected by higher fertilizer costs.

Prices paid for seed and chemicals are anticipated to rise at a considerably lower rate than for fertilizer, with overall expenditures averaging 2 percent higher than last year. The Corn Belt, Lake States, and Northern Plains regions account for roughly half of the Nation's total expenditure on these inputs.

Figure 7

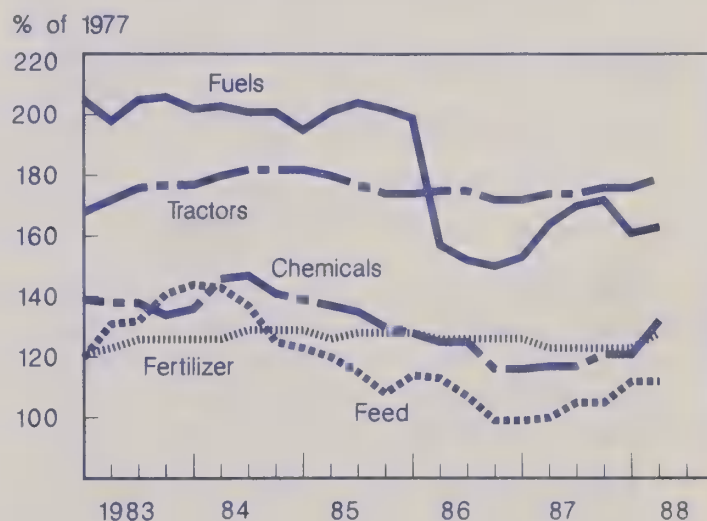
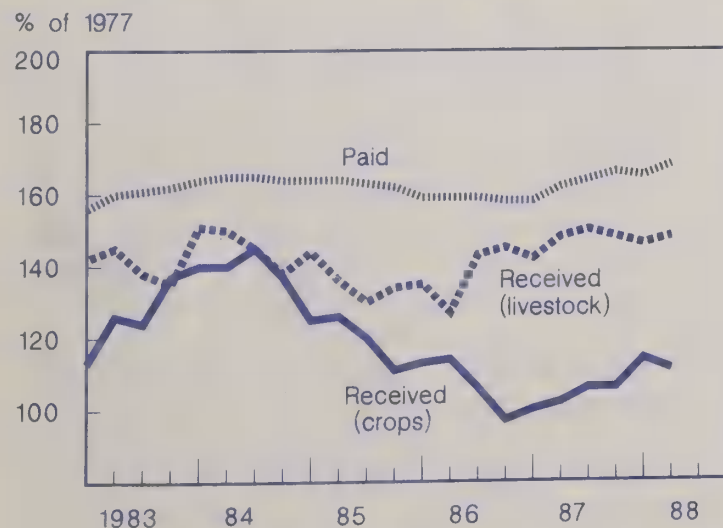
Prices Paid for Major Production Inputs

Figure 6

Prices Paid and Received by Farmers

High chemical use in cotton production accompanied by slightly higher chemical prices and an expected 1.2-million rise in cotton acreage make this an increasingly important cost component in California, Texas, and other cotton producing States.

Fuel, oil, and electricity expenses may increase roughly 5 percent in 1988. The effects of higher fuel costs will be strongest in regions concentrating in crop production, particularly the Corn Belt and Northern Plains. Tractor and combine use in grain production underlies the regional concentration of fuel costs. Cash grain and red meat enterprises (typically with mixed grain/livestock production) accounted for over

60 percent of total fuel expenditure last year. Rising utility bills will again influence mixed crop/livestock enterprises most heavily. Dairy farms will be particularly affected by a 9-percent increase in electricity expense.

Because feed grain prices are projected to continue strong in 1988, livestock operators will shoulder higher costs for this major expense item. Feed costs are expected to increase more in 1988 than any other expenditure item, rising nearly \$2 billion, or 12 percent. Livestock enterprises typically account for 90 to 95 percent of total feed expenditures. Feed represents nearly one quarter of total costs. Regional impacts will

be strongest in the Corn Belt, Pacific, and Lake States, reflecting the concentration of beef, hog, and dairy production.

With an outlook for net cash income ranging from \$50 to \$55 billion, a pickup in farm machinery purchases, reduced advance deficiency payments, moderation in interest rates, and an overall higher level of confidence in the sector, the decline in agricultural debt will likely be less than forecast last fall. In 1988 another \$8 billion in loans may be paid off, reducing debt service costs in agriculture. With this decline in principal, down to \$132 to \$142 billion from the high of nearly \$193 billion in 1983, interest

Table 3--Forecast U.S. production costs for 1988 1/

| | Corn | Grain Sorghum | Barley | Oats | All Wheat | Rice | Soybeans | Cotton |
|-------------------------|------------------|------------------|--------|-------|--------------|-------|----------|--------|
| | \$ /planted acre | | | | | | | |
| Cash expenses: | | | | | | | | |
| Seed | 17 | 4 | 4 | 6 | 6 | 24 | 9 | 8 |
| Fertilizer | 46 | 18 | 14 | 10 | 15 | 32 | 7 | 20 |
| Lime & gypsum | 2 | 1 | -- | 1 | 1 | 0 | 1 | 1 |
| Chemicals | 19 | 9 | 6 | 1 | 3 | 6 | 19 | 50 |
| Custom operations | 7 | 4 | 3 | 2 | 5 | 49 | 4 | 14 |
| Fuel, lube, & elect. | 10 | 11 | 6 | 4 | 6 | 27 | 5 | 19 |
| Repairs | 12 | 11 | 10 | 6 | 8 | 31 | 7 | 19 |
| Hired labor | 2 | 2 | 1 | 1 | 1 | 17 | 2 | 12 |
| Purchased irr. water | -- | -- | 2 | 0 | -- | 20 | 0 | 6 |
| Drying | 5 | 1 | 0 | 0 | 0 | 36 | 0 | 0 |
| Ginning | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 53 |
| Miscellaneous | -- | -- | 1 | 1 | -- | 0 | -- | 1 |
| Technical services | 1 | -- | -- | -- | -- | 6 | -- | 2 |
| Total variable expenses | 121 | 61 | 46 | 32 | 46 | 249 | 53 | 207 |
| (% change from 1987) | (4.5) | (4.4) | (4.7) | (5.0) | (4.7) | (4.4) | (3.1) | (-.1) |
| General farm overhead | 16 | 8 | 9 | 5 | 8 | 24 | 11 | 23 |
| Taxes & insurance | 20 | 11 | 10 | 16 | 9 | 15 | 14 | 11 |
| Cash interest | 35 | 14 | 15 | 12 | 14 | 32 | 26 | 31 |
| Total fixed expenses | 70 | 33 | 34 | 34 | 31 | 72 | 51 | 65 |
| (% change from 1987) | (4.5) | (4.8) | (4.7) | (4.7) | (4.7) | (5.1) | (4.4) | (4.7) |
| Total cash expenses | 191 | 93 | 80 | 66 | 77 | 321 | 104 | 272 |
| (% change from 1987) | (4.5) | (4.5) | (4.7) | (4.8) | (4.7) | (4.5) | (3.7) | (1.0) |
| Capital replacement | 37 | 29 | 25 | 18 | 21 | 56 | 27 | 45 |

1/ Forecasts are as of 05/01/88. Totals may not add due to rounding. -- Less than 50 cents.

charges are forecast at 5 percent below the 1987 level. Estimated at \$14 to \$16 billion, the interest share of debt service may reach the lowest level since 1979.

1988 Costs of Production Revised Up

The 1988 crop cost-of-production estimates have been revised upward. With the exception of seed—mainly hybrid corn—and fuels, these revisions show higher prices than were originally expected last fall.

Farmers who bought fertilizer last fall paid 4.3 percent more than a year earlier and by this past spring, prices were up another 9.1 percent. Most of the increase was for nitrogen and phosphate while potash increases occurred late last year. Corn and barley growers have felt this the most since 38 percent and 30 percent of their respective variable costs go to fertilizer.

Other items showing price increases are machinery, particularly autos and trucks, and farm and motor supplies. March reports of tractor and combine unit sales show dramatic increases. This could mean a turnaround in machinery sales with the older equipment that has been repaired for several years finally being replaced. Farmers buying both new and used equipment will probably find overall prices up between 5 and 8 percent over 1987.

Fuel prices remained steady in the first quarter but increased a few cents per gallon in the past 2 months. The increase is common as summer approaches.

INCOME BY FARM TYPE

One of the most striking characteristics of U.S. agriculture is the trend towards greater production specialization. Even though most farms produce more than one commodity, a single commodity accounts for more than half of total receipts for a majority of farms. In terms of farm income, specialization means that the financial position of some groups of farms is more affected than others by changes in the price and costs of production of particular commodities. On the other hand, the fact that most farms are not completely specialized

means that increases in some income components can offset declines in others.

The high degree of specialization, combined with variation in the degree of diversification, means that aggregate income and expense estimates do not fully reflect the condition of individual farm operations. Grouping farm enterprises according to the commodity (or group of commodities) accounting for more than half of the operation's revenue provides a better picture of how farm enterprises are expected to fare than is provided by looking only at U.S. totals.

The reader should keep in mind that income estimates for farm types will be much more sensitive to changes in factors such as prices, yields, marketing patterns, and expenses than will estimates of U.S. totals. By the very nature of specialization, a small change in the price or yield of a particular commodity can have a much larger effect on the net income of farms specializing in that commodity than on total net farm income.

Net Cash Income Up on Crop Farms, Down on Livestock Farms

The overall decline in net cash income is spread unevenly among the various farm types (table 4). Higher calendar year marketings in 1988 should result in a small increase in net cash income (less than \$1 billion or 1 percent) for crop farms. In contrast, weakening hog and milk prices, in conjunction with an increase in cash expenses, are expected to cause net cash income for livestock farms to decline slightly from the high level attained in 1987.

Net Cash Income: Crop Farms

Cash receipts will be higher for each of the four major types of crop farms as strong prices are projected for all major commodities. However, for cash grain farms, tobacco farms, and fruits, vegetable, and nursery farms, net cash income in 1988 will remain essentially unchanged from 1987 as higher receipts will not be enough to overcome higher cash expenses and lower government payments. In contrast, 1988 marketings are expected to rise sufficiently to give cotton farms a year-over-year increase in net cash income.

Table 4--Net cash income by farm type, 1985-88

| | Crop Farms | Cash Grains | Cotton Farms | Tobacco Farms | Fruits, Vegs & Nursery | Livestock Farms | Dairy | Red Meat |
|-----------------|---------------|----------------|-----------------|------------------|------------------------------|--------------------|-------|-------------|
| Million dollars | | | | | | | | |
| 1985 | 27.7 | 13.1 | 1.6 | 1.2 | 7.2 | 19.5 | 3.6 | 8.9 |
| 1986 | 26.8 | 11.4 | 1.3 | 0.7 | 7.8 | 25.1 | 5.0 | 11.4 |
| 1987F | 30 | 11 | 2 | 1 | 9 | 29 | 6 | 15 |
| 1988F | 29-31 | 10-12 | 2-3 | 1-2 | 8-9 | 27-29 | 4-6 | 13-15 |

F = Forecast. See Appendix table 5.

The expected leveling off of net cash income for grain farms can be attributed to modest declines in net earnings for both corn and wheat farms. This apparent paradox of lower 1988 net cash income in the face of higher production and prices for both the 1988/1989 corn and wheat crops is explained by three factors.

First, calendar year marketings of corn were higher in 1987 than they will be in 1988. Because a marketing year spans two calendar years, 1987 marketings are composed primarily of the 1986/1987 crop whereas most of the corn marketed in 1988 will be from 1987/1988 production, assuming historical marketing patterns hold in 1988. While the larger 1988/1989 crop will not have a large effect on net cash income until 1989, higher production will boost inventories. When estimates of net farm income by farm type become available, the higher inventories may result in a year-to-year increase in net farm income, even though net cash income is down slightly.

The second factor explaining the projected fall in net cash income for grain farms is an expected 15- to 20-percent decline in direct government payments in 1988. Target prices will be reduced roughly 3 percent for both corn and wheat in 1988. Reduced target prices mean that the fall in direct government payments for corn and wheat may exceed the increase in receipts resulting from higher market prices, even though much of the reduction in payments will have no effect on gross cash income as higher market prices offset reduced payments. With the market price between the loan rate and target price, any change in market price will be exactly offset by a change in deficiency

payments on program base yields. Thus, the expected increase in market price for corn would not affect receipts on eligible production because direct government payments would fall by an equal amount.

For corn growers, the reduction in direct payments due to lower target prices may be reinforced by lower paid land diversion (PLD) payment rates. PLD payment rates are 12.5 percent lower in 1988 than in 1987. In addition to reducing payments to operators who choose to participate in the PLD, the reduced payment rate will make the PLD less attractive for some operators. Thus, not only will payments be lower on enrolled acreage, but the number of acres enrolled is likely to be lower.

Reinforcing the effect of reduced target prices for wheat is a projected decline in the program participation rate. As total deficiency payments are determined by multiplying the deficiency payment rate by the number of bushels eligible for payment, a reduction in the number of participants will reduce the total payment, all other things held constant. The fall in the participation rate from 87 percent to 85 percent could by itself reduce deficiency payments by 2 percent if average production is the same between nonparticipants and participants.

The third factor contributing to lower 1988 net cash income for cash grain farms is higher expenses. Four inputs--seed, fertilizer, chemicals, and fuel--account for a third of variable costs for cash grain farms. In 1988, prices for these inputs are expected to rise an average 3 to 4 percent, cutting into profitability.

Labor costs, comprising around 7 percent of total costs in 1987, are expected to rise nearly 3 percent in 1988. Hired labor's relatively small share of total expenses means that this increase will not have a large impact on most farms. However, the higher cost of labor will be important for labor intensive farm types such as vegetable, fruit, and nut farms and greenhouse and nursery enterprises. For these farms, labor is the most important single expense item, comprising 21 percent of total expenses for vegetable, fruit, and nut farms and 30 percent of total expenses for greenhouse and nursery farms. Thus, any increase in labor costs will have a larger impact on the profitability of these two farm types than on other farm types.

In contrast to the other three crop farm types, net cash income for cotton farms is expected to be higher in 1988 (table 4). Gross income from the production of crops eligible for deficiency payments is affected only by changes in the quantity marketed, as long as the market price is between the loan rate and the target price. Reductions in the target price will, however, reduce gross income for program participants. For cotton farms, 1988 calendar year marketings could be up sufficiently to overcome not only the 4-percent reduction in target price but also the expected increase in cash expenses.

Livestock Farms' Net Cash Income Off Slightly in 1988

The improvement in net cash income for crop farms will be offset by a small decline in net earnings for livestock farms, primarily hog and dairy farms. Crop receipts on all livestock farm types are expected to be higher in 1988 but crop receipts constitute only 8 percent of livestock farms' revenues. The projected decline of roughly \$1 billion will be distributed unevenly across the different farm types within the livestock sector, with dairy and hog farms shouldering a disproportionate share of the decline.

Dairy farms are expected to experience the largest decline. A 6-percent reduction in the price of milk will be only partly offset by a production increase of 1 percent. In addition to the decline in revenues is a higher than

Definition of Farm Types

Farm enterprises are classified into farm types according to the commodity (or group of commodities) that accounts for more than half of the enterprise's total receipts. For example, cash grain farms are those with at least half their total receipts from wheat, corn, rice, or other cash grains, or those producing a mix of cash grains although sales of a single cash grain do not provide 50 percent of total enterprise receipts. This classification corresponds to the widely used Standard Industrial Classification (SIC) system of the U.S. Department of Commerce.

| Farm Type | SIC Codes | More than half of total receipts from one or more of the following commodities: |
|--------------------------------|-----------------|---|
| Cash grains | 11 | wheat, rice, corn, soybeans, and other cash grains |
| Cotton | 131 | cotton |
| Tobacco | 132 | tobacco |
| Fruit, vegetables, & nurseries | 134, 16, 17, 18 | potatoes and other vegetables, fruits, nuts, ornamental and nursery products |
| Crop | 11-19 | above farm types plus all other crop farms |
| Red meat | 21 | cattle, calves, hogs, sheep |
| Dairy | 24 | milk and other dairy products |
| Livestock | 21-29 | above farm types plus poultry, eggs, and other livestock |

average increase in cash expenses. Feed costs, representing over a fourth of typical dairy farm expenses may rise 12 percent this year. Also underlying higher expenses and reduced operating margins among dairy farms is a 2.5-cent-per-cwt dairy assessment.

Hog farms will also experience a large drop in net cash income. Hog production will likely expand 5 to 6 percent in calendar 1988. However, a roughly 12-percent price decline, combined with a 5-percent increase in cash expenses, is expected to offset a modest increase in receipts from crops marketed by hog producers.

In contrast to hogs, cattle prices are projected to rise and production fall. The rise in prices is expected to be between \$4 and \$5 per hundredweight while production may fall by as much as 3 percent. The result will be a slight increase in total cash receipts for cattle farms. The rise in cash expenses, primarily feed costs, will be around 4 percent. However, the ratio of cash expenses to total receipts is high for cattle farms so that even a small change in expenses has a large impact on net cash income. The result is a small

Figure 8

U.S. Regions



year-to-year decline in net cash income for cattle farms. As cattle farms and hog farms are the principal farm types within red meat farms, net cash income for red meat farms is expected to decline slightly in 1988.

Net Cash Income Down in All Regions

The two regions in which the ratio of crop receipts to livestock receipts is the highest are expected to register the smallest

Table 5--Regional distribution of cash farm income, 1987 and 1988

| Region | Year | Cash receipts | | Direct payments | Gross cash | Cash expenses | Net cash Income |
|-----------------|------|---------------|-----------|-----------------|------------|---------------|-----------------|
| | | Crops | Livestock | | | | |
| Billion dollars | | | | | | | |
| Northeast | 1987 | 3.2 | 6.3 | 0.3 | 10.0 | 6.1 | 4 |
| | 1988 | 3.3 | 6.2 | 0.3 | 10.0 | 6.4 | 3 to 4 |
| Southeast | 1987 | 10.3 | 10.4 | 0.7 | 22.3 | 13.3 | 9 |
| | 1988 | 10.9 | 10.7 | 0.6 | 22.9 | 13.9 | 8 to 9 |
| Midwest | 1987 | 23.1 | 34.2 | 10.8 | 70.1 | 46.1 | 24 |
| | 1988 | 24.9 | 33.7 | 9.3 | 69.0 | 47.6 | 22 to 24 |
| South-central | 1987 | 6.5 | 11.5 | 2.7 | 21.7 | 14.0 | 8 |
| | 1988 | 7.5 | 11.5 | 1.9 | 21.6 | 14.4 | 7 to 8 |
| West | 1987 | 17.9 | 13.0 | 2.3 | 34.1 | 20.0 | 14 |
| | 1988 | 18.9 | 12.9 | 1.7 | 34.1 | 20.7 | 13 to 14 |
| U.S. Total | 1987 | 60 | 75 | 17 | 158 | 100 | 57 |
| | 1988 | 64 to 66 | 74 to 76 | 13 to 15 | 157 to 161 | 101 to 105 | 50 to 55 |

year-to-year declines in net cash income. In the Southeast, where the projected decline in net cash income is less than 2 percent, the ratio was nearly one-to-one. In the West, where the ratio of crop receipts to livestock receipts was nearly 1.4 in 1987, net cash income is projected to fall by 4 to 5 percent. Net cash income for each of the other three regions is expected to fall 6 percent or more.

The mix of particular crops and livestock is also important in determining the movement of income among the five regions. The Northeast, with a high concentration of dairy farms, is expected to experience one of the larger year-to-year declines in net cash income. In contrast, the Southeast is expected to outperform the other four regions because the farm types that are expected to experience the largest declines in net cash income are less important in this region than the others. Dairy farms and cattle farms are important in some States in the Southeast but tobacco, peanuts, and poultry are relatively more important in this region than in others.

FARM ASSETS

U.S. agriculture's financial position continues to improve as farm real estate values rose 2.5 percent in 1987 and farm debt dropped more than 8 percent to \$143 billion, \$50 billion below the 1983 peak. This upward trend in farmland values reverses the

31-percent drop in asset values between the 1981 peak and 1986 and reflects higher expected returns from current income. Higher asset values and continued declines in farm debt boosted 1987 farm equity for the first time since 1980. In fact, equity rose an estimated \$35 billion in 1987 and is likely to stabilize between \$590 and \$600 billion in 1988. Strengthening of farm sector equity continues to help borrowers meet existing loan obligations and finance new investments.

Asset Growth Continues

The value of U.S. agricultural assets on December 31, 1987 (excluding operator household assets) is estimated at \$714 billion, up 3 percent from a year earlier. The increase reverses a continuous downturn that began in 1982. Most of the increase can be attributed to farm real estate values. At the end of 1987, farmland and buildings (excluding operator dwellings) accounted for 73 percent of the total asset value of the sector, compared with 79 percent in 1981.

Nonreal estate assets increased 5 percent in 1987 due primarily to a \$10-billion increase in the value of livestock and poultry. Livestock and poultry inventory values are expected to rise another 3 percent in 1988 due mainly to higher cattle values. The value of crop inventories probably rose slightly in 1987, and may fall about 15 percent in 1988 due to a drawdown in stocks. Machinery and equipment values likely fell slightly in 1987, but may rise

Table 6--Balance sheet 1/

| Year | Current dollars | | Deflated dollars (\$1982) 2/ | | |
|---------|-----------------|-------------|------------------------------|-------------|------------|
| | Assets | Liabilities | Assets | Liabilities | Equity |
| | Billion dollars | | Billion dollars | | |
| 1975-79 | 691.8 | 116.8 | 1005.0 | 169.7 | 835.3 |
| 1980-84 | 959.7 | 192.8 | 973.1 | 195.5 | 777.6 |
| 1985 | 750.1 | 175.2 | 674.5 | 157.6 | 517.0 |
| 1986 | 691.6 | 155.0 | 606.1 | 135.8 | 470.3 |
| 1987F | 714 | 143 | 608 | 121 | 487 |
| 1988F | 725 to 735 | 132 to 142 | 600 to 610 | 108 to 118 | 485 to 495 |

F = Forecast. 1/ Excludes operator households and CCC activity. 2/ Deflated by the GNP implicit price deflator, 1982=100.

about 2 percent in 1988, due primarily to increased sales (particularly for combines and tractors of 40 horsepower and over) and higher prices. Farm financial assets rose an estimated \$1 billion in 1987 and may rise the same amount in 1988, even though large paydowns in farm debt are occurring.

The increase in U.S. asset values reflects strengthening of the agricultural sector's financial position during 1987 and cautious optimism about 1988. While net income was record high in 1987, debt continued to decline. The improved income and debt levels, combined with lower interest rates and adequate credit for farm real estate loans, brought buyers back into the real estate market. In the Midwest, an unusually large proportion of the sales were for cash. U.S. farmland values are forecast to increase 2 to 4 percent during 1988—roughly at the rate of inflation. Increased crop receipts are expected to keep 1988 net cash income high despite lower Federal supports and higher operating costs. Massive balance sheet restructuring over the last several years has left current farm operators in financial positions that would allow them to withstand at least temporary setbacks in agricultural returns. However, because government payments are still expected to account for 15 to 20 percent of net cash income in 1988, uncertainty related to farm program legislation is likely to dampen any major nationwide increase in values. Less variation in regional trends is expected.

Regional Variations in Real Estate Values

Although the U.S. average value per acre of farm real estate bottomed out during 1987, the 5-year downward trend did not reverse in all regions (figure 9). Values declined in the Pacific, Mountain, and Southern Plains regions, while the Delta showed no change. The declines in the Mountain and Pacific States generally reflect the greater proportion of grazing land in those regions. Continued problems in the oil industry contributed to the percentage changes shown for the Southern Plains and Delta regions. Farmland values increased in the remaining six regions, with increases of 7 percent or more in the Corn

Figure 9

Percent Change in Farmland Value Per Acre, February 1987-88, By Farm Production Regions



Belt, Lake States, Northern Plains, and Northeast.

The surprisingly large farmland value increases in the Corn Belt and Lake States during 1987 are due, in part, to improved earnings on crop and livestock farms. But some of the increase may also be attributed to an upward adjustment in values brought about by a market over-reaction. Values had fallen below levels supportable by current economic conditions. The two Midwest States where values increased the most dramatically during 1987—Iowa and Minnesota—are also the two States where values rose the most during the 1970's and fell the most during the early 1980's.

The declines in the Pacific and Mountain States during 1987 were less severe than in 1986. Typically, the value trend in these regions has lagged the Corn Belt trend. With strong livestock prices during 1987 and a similar forecast for cattle and calf prices during 1988, average values in these grazing regions may start rising during 1988. However, lack of early spring moisture in some States has diminished the outlook for a repeat of the unusually good year experienced in 1987.

Values in the remaining regions are also expected to increase moderately during 1988, supported in part by continued nonagricultural demands for farmland.

From a national perspective, the downturn in farmland values that began in 1982 was severe—amounting to more than one-third in nominal dollars and almost one-half in real dollars. But the effect has been uneven, varying by location relative to urbanization, by type of farmland, and by farm production region.

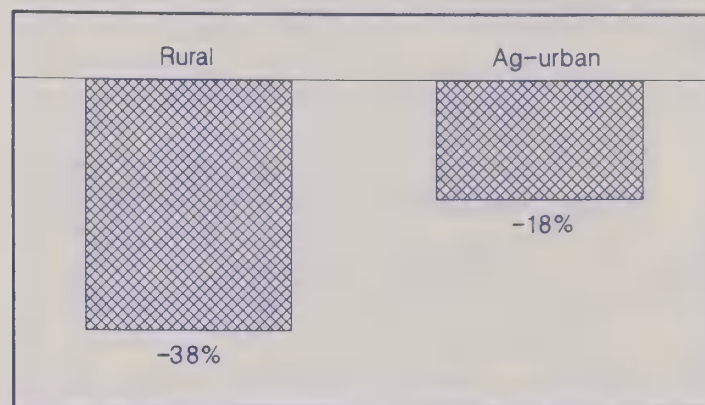
The effect of urbanization, which increases the nonagricultural demand for farmland, has been to soften the decline in farmland prices. This is demonstrated by a comparison of value changes nationally for urban-influenced and more rural counties (figure 10). Farmland values in 471 "urban" or "ag-urban" counties fell only 18 percent, while the remaining agricultural counties in the contiguous 48 States fell 38 percent. This effect is especially pronounced in New England, where farmland values increased continuously after 1981 (up more than 55 percent), while all other contiguous States suffered declines.

The depth of the decline also depended upon whether the land was irrigated or nonirrigated cropland, or grazing land (figure 11). Irrigated cropland and grazing land have declined substantially less than nonirrigated cropland values, but they continued to fall 1–2 percent during 1987, while nonirrigated cropland values rose by 7 percent. As the farmland markets reach relative equilibrium, the differential in total declines probably will diminish.

Average per-acre values peaked in 1981 or 1982 for all regions except the Pacific (1984). The change in value between the regional peak and February 1987 varied from an 18-percent increase in the Northeast to a 54-percent decline in the Corn Belt (figure 12). Values in New England have increased every year since the end of World War II, reflecting the increasing urbanization of the region. The Corn Belt was the most severely affected, followed closely by the Lake States and Northern Plains. The Delta also experienced a substantial decline. Agricultural production in these regions, heavily oriented to commodities that were export-dependent in the 1970's, has suffered when the rising value of the dollar and increased foreign production reduced

Figure 10

Percent Change in Farmland Value in Ag-Urban and Rural Counties, 1982-87

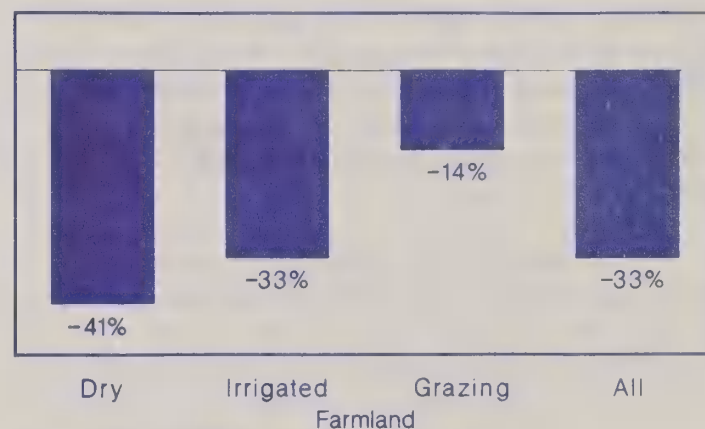


Excludes Alaska and Hawaii.

Source: USDA Survey of ASCS County Executive Directors.

Figure 11

Percent Change in Farmland Value by Type, 1982-87

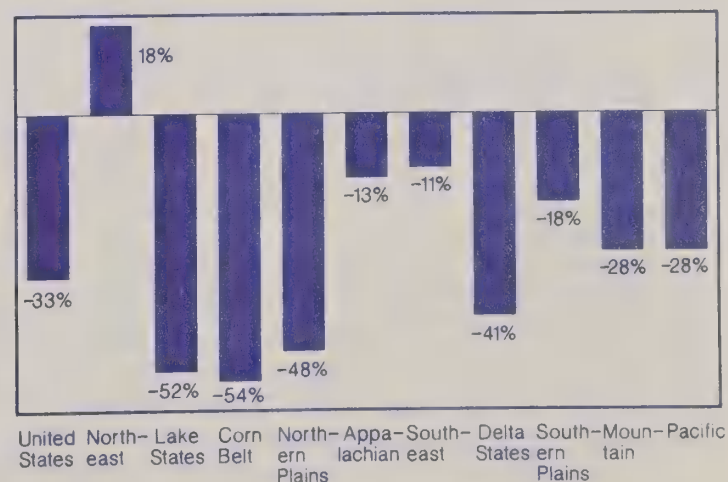


Excludes Alaska and Hawaii.

Source: USDA Survey of ASCS County Executive Directors.

Figure 12

Change Between Peak in Regional Farmland Value and 1987 Value



agricultural exports. In the Pacific and Mountain States, the declines were less severe, partially because of the large acreages of grazing land in these States. The smallest decreases were in the Southern Plains, Southeast, and Appalachia, probably reflecting continuing nonagricultural demand for farmland.

Stable to moderately rising U.S. farmland prices are a key indicator that investors have renewed confidence in the long run profitability of agriculture. These land value gains are strengthening the sector's debt-carrying capacity by stabilizing the value of real estate collateral.

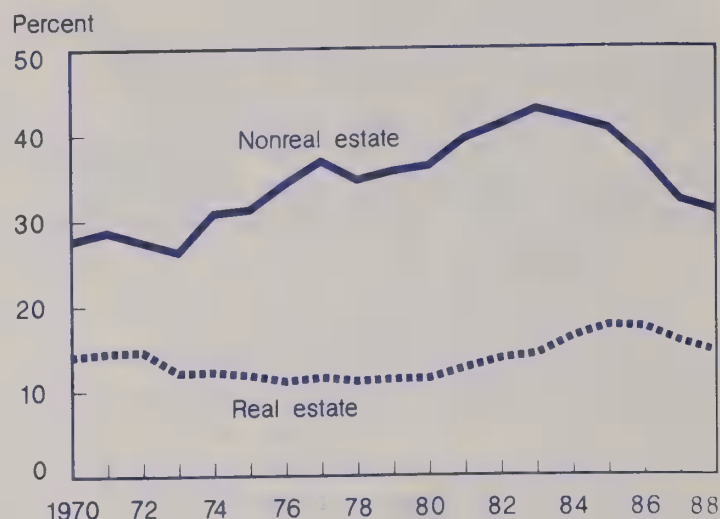
FARM DEBT

Preliminary estimates indicate that total farm business debt declined more than 8 percent in 1987, marking the fourth consecutive year of debt reduction (table 7). Stabilization of land values and improvement of the agricultural economy did not translate into increased loan demand, as farmers used available cash to replace machinery and equipment, to expand operations, and to reduce obligations.

Expectations of a worsening sector economy and anticipations of further erosion of land values were not realized in 1987. Instead, improving real estate and nonreal

Figure 13

Farm Debt as Percentage of Assets



estate debt/asset ratios indicate a strengthening of the financial position of the sector (figure 13). Higher land values and lower real estate debt reduced the real estate debt/asset ratio to 15.4 percent, down from the 1985 peak of 17.5 percent. By the end of 1988, the ratio is forecast to further decline to 14 percent, similar to the 1970-71 pre-boom era. Stable nonreal estate asset values combined with lower debt to produce a nonreal estate debt/asset ratio of 32 percent, the lowest value for this measure since 1975. The ratio, which peaked in 1983 at 42.8 percent, is forecast to decrease to 31 percent by the end of 1988. The lowering of these

Table 7--Debt outstanding, excluding operator households, by lender, December 31

| Lender | 1983 | 1984 | 1985 | 1986 | 1987P | 1988F |
|-----------------------------|-----------------|---------|---------|-----------------|-------|------------|
| | Million dollars | | | Billion dollars | | |
| Real estate | | | | | | |
| Federal Land Banks | 45,026 | 45,321 | 41,204 | 34,773 | 30 | 27 to 28 |
| Farmers Home Administration | 8,718 | 9,206 | 9,540 | 9,482 | 9 | 8 to 10 |
| Life insurance companies | 11,834 | 11,592 | 11,035 | 10,199 | 10 | 8 to 10 |
| Commercial banks | 8,494 | 9,313 | 10,443 | 11,338 | 13 | 14 to 15 |
| CCC storage facility | 888 | 623 | 307 | 123 | 1/ | 1/ |
| Individuals & others | 29,847 | 27,636 | 25,160 | 22,218 | 19 | 17 to 18 |
| Total | 104,806 | 103,691 | 97,690 | 88,132 | 81 | 76 to 80 |
| Nonreal estate | | | | | | |
| Commercial banks | 37,075 | 37,619 | 33,738 | 29,678 | 28 | 25 to 26 |
| PCAs & FICBs | 19,392 | 18,086 | 14,002 | 10,581 | 9 | 8 to 10 |
| Farmers Home Administration | 12,855 | 13,740 | 14,714 | 14,425 | 14 | 12 to 14 |
| Individuals & others | 18,566 | 17,640 | 15,070 | 12,143 | 11 | 10 to 12 |
| Total | 87,888 | 87,084 | 77,525 | 66,827 | 62 | 56 to 62 |
| Total debt | 192,695 | 191,076 | 175,213 | 154,960 | 143 | 132 to 142 |

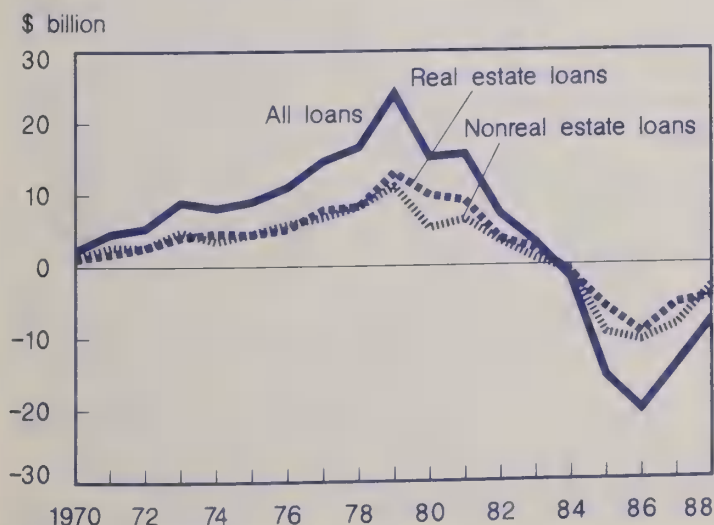
P = Preliminary. F = Forecast. 1/ Less than \$500 million.

ratios is due mainly to the continuing reduction in outstanding debt.

The general contraction in demand for agricultural loans continued in 1987, despite increased agricultural exports and commodity prices, decreased commodity surpluses, and improved net cash farm income. Direct government payments, accounting for almost 30 percent of net cash income, provided the margin allowing many farmers to reduce the need for new loans and to retire existing debt. Uncertainty about the permanence of the return of farm sector financial health restrained both farmers and lenders from engaging in a new round of debt-financed expansion.

Total farm business debt has fallen 26 percent from its 1983 peak (figure 14). The rate of debt reduction, however, slowed from 11.6 percent in 1986 to 8 percent in 1987. A further decrease in total debt of over 4 percent is forecast for 1988. The slowing in the rate of reduction is partially due to lender efforts to restructure problem loans, rather than foreclose, when restructuring is the less costly alternative. In earlier years, lenders had emphasized collateral values in evaluating exposure to potential loan losses, which led to rapid initiation of foreclosure. The decline in land values and limited markets for foreclosed properties prompted lenders to develop loan restructuring programs to work out troubled loans, and to emphasize repayment capacity and financial condition of the borrower, rather than the value of loan security.

Figure 14
Annual Change in Farm Debt



Simultaneously, legislation concerning relationships between borrowers and lenders encouraged the restructuring of problem loans, and also effectively provided incentives to lenders to thoroughly screen loan applicants. The Agricultural Credit Act of 1987 mandates that Farm Credit System (FCS) institutions, the Federal Land Banks (FLB's) and Production Credit Associations (PCA's), consider restructuring options prior to foreclosure actions, if such options are the least cost alternatives. Potential borrower utilization of Chapter 12 bankruptcy provides lenders with an incentive to restructure problem loans, rather than risk losses through settlement. However, the possibility of borrowers' invoking Chapter 12 in response to lenders' debt collection actions has created pressure to tighten loan approval criteria for new borrowers, and has increased interest rates and collateral requirements and reduced credit availability to marginal loan applicants.

Real Estate Debt Down 3 to 4 Percent

Real estate debt is forecast to decrease 3 to 4 percent in 1988, as farmers continue to use high current income to reduce financial exposure. However, farmer reaction to generally rising land values may encourage credit-financed expansion beyond the limits possible through internal funding. If lender programs to reduce inventories of owned properties are successful, new borrowing may offset the paydown of existing debt, resulting in a net increase in outstanding debt. As land values increase, lenders are actively marketing land acquired through previous foreclosures, offering favorable financing to purchasers rather than auctioning foreclosed properties for cash. These advantageous 'purchase money mortgages' being offered by lenders serve both to encourage farmers to expand holdings and to allow lenders to reduce real estate inventories. The policy also permits the lender to maintain his share of the farm credit market, and bolsters farmland prices, while reaffirming the lender's commitment to remain a reliable source of agricultural credit.

Federal Land Bank debt outstanding decreased 34 percent from 1984 through 1987, including a 14-percent drop in 1987 alone. FLB debt is forecast to decline almost 8 percent in 1988. Generally, Farm Credit System lenders are offering concessionary

financing to purchasers of foreclosed properties. Farm Credit Services, St. Paul, for example, has developed several acquired property sales programs to stimulate foreclosure sales. The Loan Values Guaranteed program guarantees buyer satisfaction by allowing purchasers, at the time of sale, to specify a future date at which they can reconsider their purchase. Down payments and principal payments are placed in special escrow accounts until the reconsideration option date has passed. If the purchaser elects to rescind the sale, Farm Credit Services will return the down payment and any principal payments the purchaser-borrower may have made. Additionally, Farm Credit Services' Multiple Choices program allows purchasers to select from a menu of down payment, interest rate, and repayment schedule options.

Farmers Home Administration (FmHA) real estate debt decreased more than 2.5 percent in 1987, and is anticipated to decline by slightly less in 1988. The debt forecast for 1988 could change dramatically if FmHA elects to restructure a considerable portion of the debt held by its delinquent borrowers. The Agricultural Credit Act of 1987 legislates a policy of maintaining FmHA borrowers on the farm, while limiting the long term losses to FmHA. Borrowers failing to show positive cash flow under interest rate reduction and debt deferral programs can have loans written down to current appraised value less FmHA's cost of liquidation. Loans restructured in this way would create an FmHA equity interest, with the amount written down recoverable at some point in the future, at either the time of resale or a predetermined reappraisal date. While the exact amount of loans eligible for this restructuring is presently unknown, substantial write-downs, though recoverable in the future, would significantly lower the FmHA outstanding debt reported at the end of 1988.

Life insurance company lending on farmland has fallen 20 percent from its 1982 peak. Debt outstanding decreased almost 7 percent in 1987, and is forecast to decline more than 5 percent in 1988. Although several life insurance companies are actively marketing properties acquired through foreclosure, most are managing their past foreclosures, choosing to hold long term

agricultural assets in their portfolios as farmland property owned instead of farm real estate mortgages.

Commercial bank debt reported as secured by farm real estate has increased throughout the 1980's, due primarily to banks requiring additional security for production and machinery loans. While total farm real estate debt decreased more than 23 percent from 1983 through 1987, commercial bank real estate debt increased almost 52 percent, including an increase of almost 14 percent in 1987. An increase of over 12 percent is forecast for 1988, as banks continue to seek farmland as security for operating loans and new machinery loans. Real estate debt increased from 18 percent of all commercial bank debt in 1982 to almost 32 percent in 1987, and is forecast to exceed 36 percent by the end of 1988. Bank real estate lending should increase slightly in response to experimental use of the secondary mortgage market authorized by the Agricultural Credit Act of 1987.

The Commodity Credit Corporation (CCC) has made storage and drying facility loans to farmers since 1949. The outstanding debt on these loans peaked at almost \$1.5 billion in 1980. Few new loans have been issued since, and, by the end of 1987, the loan balance had gradually been paid down to less than \$50 million.

Real estate debt owed to individuals and others, created primarily through seller financing of real estate transfers, decreased an estimated 14 percent in 1987, and is forecast to decline 7 percent in 1988. From 1983 through 1987, real estate debt owed to individuals and others decreased more than 36 percent, as lower sales prices and growing seller hesitancy to finance land transactions reduced outstanding debt. Although land values are improving in 1988, most owners who have weathered substantial capital losses on their farmland will be reluctant to sell in a rising market.

1988 Nonreal Estate Debt Down 5 Percent

Total nonreal estate debt declined almost 30 percent from 1983 through 1987. The decrease is forecast to slow from over 7

percent in 1987 to 5 percent in 1988. While the improved financial position of farmers and advanced government program payments have lessened the demand for operating loans, the farm sector's machinery complement has been aging. In 1987, capital expenditures for tractors, machinery, and equipment were only 37 percent of their 1979 peak. While expenditures for these capital items are forecast to increase almost 16 percent in 1988, the impact of these purchases on nonreal estate debt outstanding is unclear. While the current sector cash position permits internal financing of a substantial portion of capital replacement expenditures, a significant increase in machinery purchases would likely raise the demand for loans from commercial banks, Production Credit Associations, and individuals and others (through farm machinery financing corporations).

Commercial banks continue to be the primary nonreal estate debt source, even though outstanding debt decreased more than 26 percent from 1984 through 1987. The annual decrease in debt slowed from 12 percent in 1986 to 7 percent in 1987, and is forecast to be about 7 percent again in 1988. This is partially because nonreal estate debt is being reported as real estate debt, as banks continue to place real estate mortgages to secure operating and machinery loans. Bank lending for machinery purchases in 1988 may affect reported real estate debt more than nonreal estate debt.

The nonreal estate debt owed to the Farm Credit System, the sum of Production Credit Association (PCA) loans and Federal Intermediate Credit Bank (FICB) loans through other financial institutions, fell almost 55 percent from 1982 through 1987. The 12-percent decrease in 1987 represented an easing of the rate of reduction from the 24-percent decline in 1986. Combined PCA/FICB outstanding debt for 1988 is forecast to stabilize at its 1987 ending level. As loans for equipment replacement increase, PCA's report rising loan volume through the first quarter of 1988. This possibly signals a return to traditional normal seasonal borrowing patterns, at a reduced level of outstanding loans.

The rate of decrease in Farmers Home Administration nonreal estate debt was about

2 percent in both 1986 and 1987. That rate of decline is forecast to accelerate to over 7 percent in 1988, as FmHA initiates debt write-off actions. Also, FmHA is actively pursuing a policy of guaranteeing loans made by other lenders, principally commercial banks, instead of issuing loans directly to farmers.

Nonreal estate debt owed to individuals and others decreased more than 10 percent in 1987, following declines of almost 20 percent in 1986 and 15 percent in 1985. From 1982 through 1987, individuals and others' nonreal estate debt fell by almost 43 percent. However, this trend is forecast to reverse in 1988, as farm machinery financing corporations' loans for the purchase of new machinery and equipment may increase by as much as 20 percent. This may be offset by the continuing payoff of Small Business Administration agricultural loans and reduced demand for merchant and dealer financing of purchased inputs.

Lender Market Shares Change

Total farm business debt decreased by about \$50 billion from 1983 through 1987. This debt reduction has not been evenly distributed among all lenders (table 8). During 1987, commercial banks passed the Farm Credit System as principal holder of combined real estate and nonreal estate farm debt. The Farm Credit System's market share declined from 33 percent of all outstanding debt in 1983 to slightly less than 28 percent at the end of 1987. Over the same period, commercial banks have increased market share from 23.6 percent to over 28 percent, despite an 11-percent decrease in outstanding loans.

The Farmers Home Administration's share of total debt increased from 11.2 in 1983 to over 16 percent by the end of 1987, due mainly to FmHA inability (through court injunction and legal action) to initiate collection actions against delinquent borrowers. Potential aggressive loan restructuring and write-offs, and shifting of program emphasis to guaranteed loans, may significantly reduce FmHA shares of both real estate and nonreal estate debt.

Federal Land Banks continue to be the principal source of farm real estate credit,

Table 8--Distribution of debt, excluding operator households, by lender, December 31

| Lender | 1983 | 1984 | 1985 | 1986 | 1987P | 1988F |
|-----------------------------|---------|-------|-------|-------|-------|-------|
| | Percent | | | | | |
| Real estate | | | | | | |
| Federal Land Banks | 43.0 | 43.7 | 42.2 | 39.5 | 37 | 35 |
| Farmers Home Administration | 8.3 | 8.9 | 9.8 | 10.8 | 12 | 12 |
| Life insurance companies | 11.3 | 11.2 | 11.3 | 11.6 | 12 | 12 |
| Commercial banks | 8.1 | 9.0 | 10.7 | 12.9 | 16 | 19 |
| CCC storage facility | 0.8 | 0.6 | 0.3 | 0.1 | 1/ | 1/ |
| Individuals & others | 28.5 | 26.7 | 25.8 | 25.2 | 24 | 23 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100 | 100 |
| Nonreal estate | | | | | | |
| Commercial banks | 42.2 | 43.0 | 43.5 | 44.4 | 45 | 43 |
| PCAs & FICBs | 22.1 | 21.0 | 18.1 | 15.8 | 15 | 16 |
| Farmers Home Administration | 14.6 | 15.7 | 19.0 | 21.6 | 23 | 22 |
| Individuals & others | 21.1 | 20.2 | 19.4 | 18.2 | 18 | 19 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100 | 100 |
| Combined | | | | | | |
| Farm Credit System | 33.4 | 33.3 | 31.5 | 29.3 | 28 | 27 |
| Farmers Home Administration | 11.2 | 12.0 | 13.8 | 15.4 | 16 | 16 |
| Life insurance companies | 6.1 | 6.1 | 6.3 | 6.6 | 7 | 7 |
| Commercial banks | 23.6 | 24.6 | 25.2 | 26.5 | 28 | 29 |
| CCC storage facility | 0.5 | 0.3 | 0.2 | 0.1 | 1/ | 1/ |
| Individuals & others | 25.1 | 23.7 | 23.0 | 22.2 | 21 | 21 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100 | 100 |

P = Preliminary. F = Forecast. 1/ Less than 1 percent.

despite a loss of market share from 43.7 percent in 1984 to 37 percent in 1987. Individuals and others remain the second largest real estate lender, though their market share has declined by 5 percentage points since 1983, and now accounts for less than 24 percent of real estate debt. While life insurance companies' share of debt has remained fairly stable at 11-12 percent, commercial banks and the Farmers Home Administration have experienced increasing shares of farmland debt owed by farmers. These general trends in market shares are expected to continue through 1988, with commercial banks' share increasing, while Farmers Home Administration and life insurance companies' shares remain fairly constant, and shares held by Federal Land Banks and individuals and others decrease again.

Commercial banks' share of nonreal estate debt increased from 42 percent to almost 45 percent between 1983 and 1987. Over the same period, the FmHA share increased from less than 15 percent to almost 23 percent. These gains resulted largely from PCA/FICB reductions, as the Farm Credit System share of nonreal estate debt decreased

from 22.1 percent in 1983 to 15 percent in 1987. From 1983 to 1987, the share owed to individuals and others declined more than 3 percentage points to less than 18 percent. Nonreal estate debt shares are forecast to remain relatively constant through the end of 1988, with the PCA/FICB and individuals and others' shares increasing slightly and the commercial banks' and FmHA shares decreasing.

Equity Rising

Reflecting the 31-percent drop in asset values between the 1981 peak and 1986 and the 15-percent decline in debt, equity values fell 34 percent from \$814.4 billion to \$536.6 billion. Farm equity fell 46 percent in real terms (1982 dollars) over the same period. However, farm equity is estimated to have risen over 6 percent in 1987 to \$571 billion, and is expected to be up 4 percent in 1988 to \$590-600 billion. Farm equity in 1982 dollars is estimated to rise 3 percent in 1987 and another 1 percent in 1988.

This firming of the equity "bottom line" is essential for long term financial recovery in the farm sector. Growth in farm equity has

accompanied reduction in the amount of debt used to finance operating expenses and purchases of machinery and equipment.

FINANCIAL RATIOS AND RETURNS

Key aspects of farm financial performance such as liquidity, solvency, profitability, and financial efficiency can be assessed using some common ratios (appendix table 8). Ratios express financial relationships between the income and balance sheet statements in percentage terms and provide a relative basis for monitoring and comparing the financial strength of the farm sector over time.

For each of the performance groups, current data suggest that the farm sector as a whole is in an improved financial position. For example:

Liquidity ratios show that:

- o Farm households and farm businesses are better able to repay principal and interest; and
- o A lower proportion of gross farm income is needed to service debt.

Solvency measures indicate that:

- o Debt/asset and debt/equity ratios are projected at 17 to 20 percent and 21 to 24 percent in 1988 -- down from the 1985 peaks of 23.4 and 30.5 percent.

Profitability ratios show that:

- o Farm sector earnings in relation to the level of resources committed were up in 1987 and should remain relatively high in 1988.

Financial efficiency measures, which track competency in performance of management functions and resource use suggest that:

- o Production expenses have been a declining portion of gross cash income. The gross ratio is expected to rise slightly in 1988;
- o The proportion of gross cash farm income committed to interest payments is down

Figure 15

Liquidity Ratios

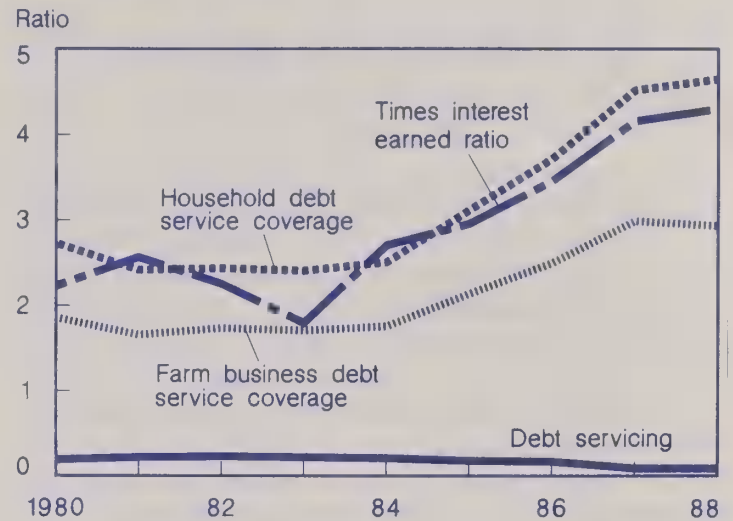


Figure 16

Solvency Ratios

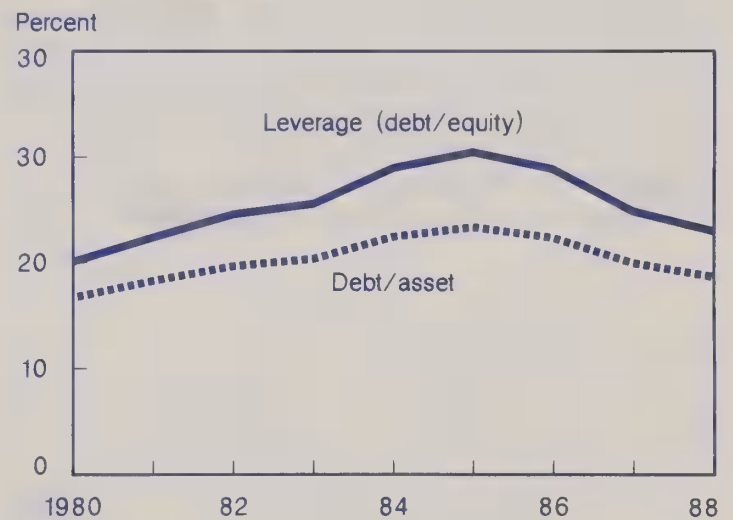
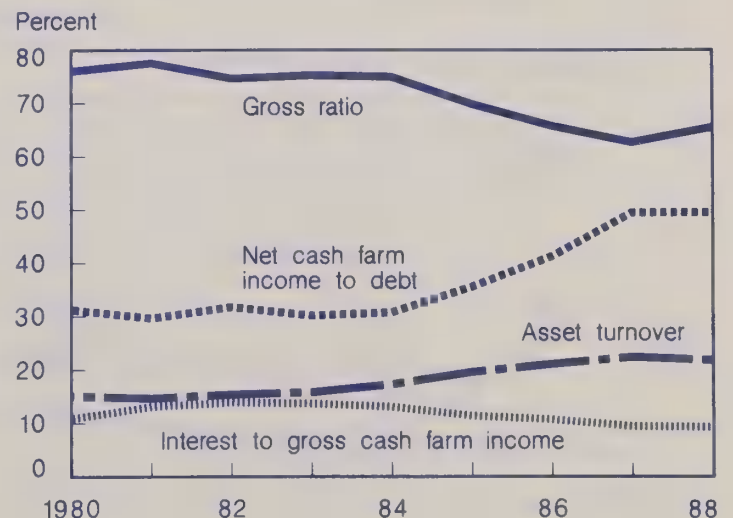


Figure 17

Financial Efficiency Ratios



from the 1982 peak of nearly 14 percent to 8 to 10 percent in 1988;

- o Gross farm income generated per dollar of farm business assets—forecast at 21 to 23 percent in 1988, is up from 14.7 percent in 1981; and
- o Net cash farm income to debt is forecast at 49 to 51 percent in 1988, suggesting that farmers are much more able to repay their principal and debt service than in 1981 when the ratio was only 30 percent.

These financial ratios indicate that farm financial liquidity is improving relative to the early 1980's. In 1987 the household debt service ratio, the farm business debt service ratio, and the debt servicing ratio all suggest that liquidity is up relative to the preboom 1970–71 period, although the times interest earned ratio in 1987 (4.2) is somewhat below the 1970–71 average of 6.0. The debt/asset and debt/equity solvency ratios are below the peak levels of 1984–86 and are about equal to 1970–71 levels. Likewise, all profitability ratios were up and should remain relatively high in 1988. The rates of return to assets (ROA) and to equity (ROE) from current

income forecast for 1988 are above 1970–71 levels of 3.1 and 2.3 percent. Finally, the financial efficiency ratios are up relative to the 1980–86 period, and are about equal to 1970–71 preboom values.

Farm Sector Returns and Cash Flow Rising

Adjustments in farm sector asset values, returns to assets, and cash flow have enhanced farmers' ability to service debt out of current earnings and have raised returns to farm assets and equity. The 2.5-percent increase in farm real estate values in 1987 was more than offset by rising returns to farm assets, raising the rate of return on farm assets from current income from the historically low levels of the late 1970's and early 1980's to 5.5 percent. In 1988, the rate may decline slightly (figure 19). The rate of return on equity from current income increased to 4.3 percent in 1987 but may decline slightly in 1988 (table 9).

Rising residual income to farm assets and rising asset values also led to real capital gains in 1987. The total rate of return on farm assets includes both returns from current income and returns from real capital gains. The projected total return on assets is

Figure 18

Farm Assets and Returns

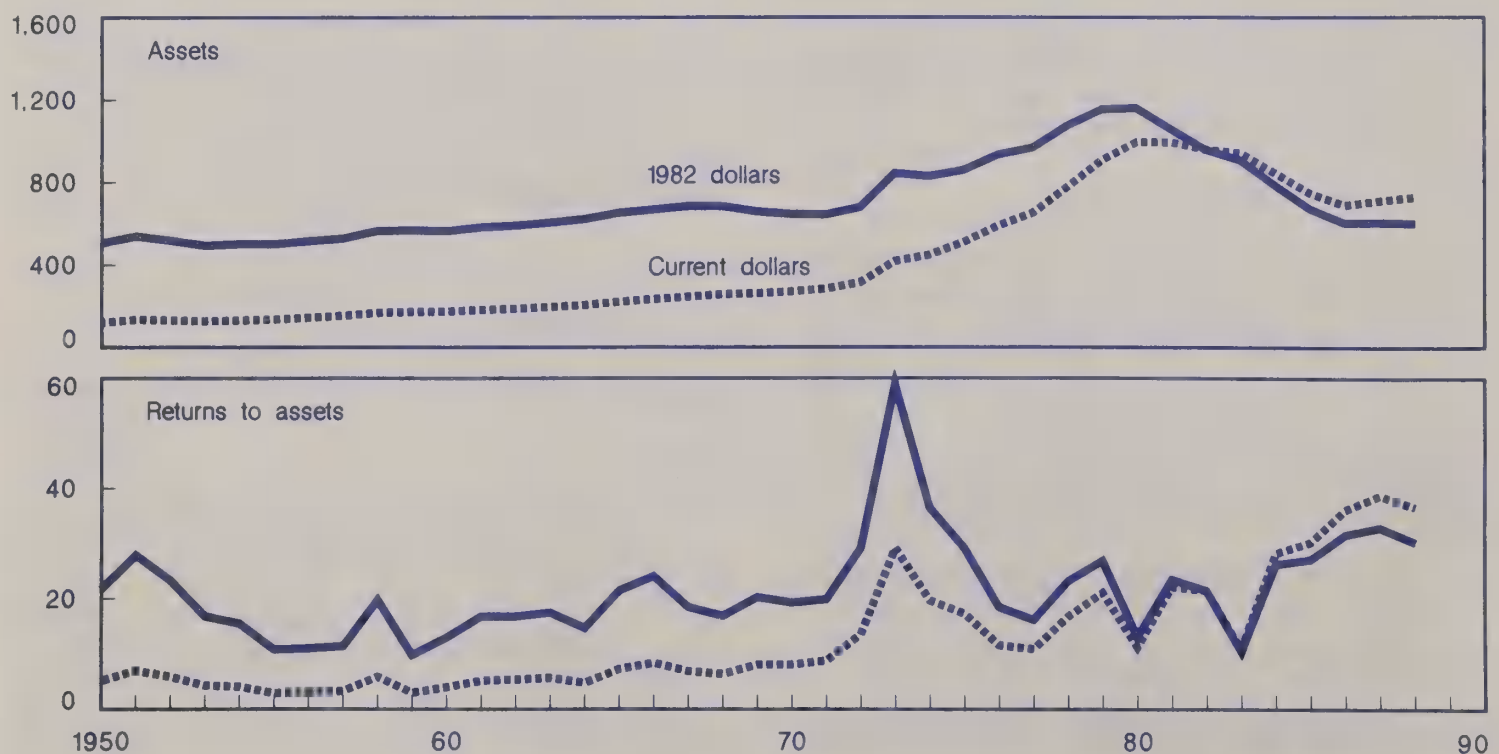
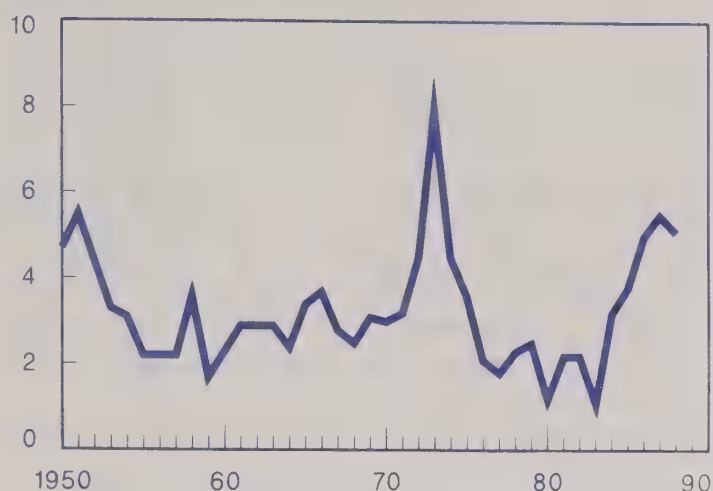


Figure 19

Rate of Return to Farm Assets

Percent



expected to be about the same in 1988 reflecting modest increases in both land prices and returns to farm assets (tables 9 and 10).

The differential impact of high real borrowing costs is apparent in comparisons of real cash flow before and after payment of interest. Real cash flow before interest payments depicts the experience of farmers with little or no debt. Real cash flow after interest payments depicts the experience of farmers whose relative amount and cost of debt were near the sector averages--between 1980-85, a debt/asset ratio of 20.2 percent and an average interest rate of 10.6 percent. Although cash flow before interest payments averaged about \$55 billion (\$1982) between 1980-85, cash flow after interest payments averaged about \$35 billion over the same period. Farmers more heavily leveraged or

Table 9--Rates of return to assets and equity 1/

| Year | Returns to assets | | | Returns to equity | | |
|---------|-------------------|--------------------|--------|-------------------|--------------------|--------|
| | Income | Real capital gains | Total | Income | Real capital gains | Total |
| | Percent | | | | | |
| 1975-79 | 2.5 | 8.1 | 10.6 | 1.4 | 8.1 | 9.5 |
| 1980-84 | 2.0 | -5.2 | -3.2 | -.1 | -5.1 | -5.2 |
| 1985-86 | 4.4 | -10.4 | -6.0 | 2.8 | -10.4 | -7.6 |
| 1987F | 5.5 | 0.0 | 5.6 | 4.3 | 1.1 | 5.5 |
| 1988F | 4 to 6 | 0 to 1 | 5 to 6 | 3 to 5 | 0 to 1 | 4 to 5 |

F = Forecast. 1/ Excludes operator households. Totals may not add due to rounding. Returns to assets and returns to equity are calculated using the average of the current and previous year's assets and equity, respectively.

Table 10--Returns to assets and equity

| | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987F | 1988F |
|--------------------------------|----------------------|------|------|------|------|------|------|-------|------------|
| | Billion 1982 dollars | | | | | | | | |
| Gross farm income | 161 | 164 | 151 | 135 | 151 | 140 | 131 | 132 | 125 to 135 |
| Returns to operators | 13 | 22 | 17 | 17 | 24 | 25 | 29 | 35 | 30 to 34 |
| Residual income to farm assets | 13 | 23 | 22 | 10 | 26 | 27 | 32 | 33 | 29 to 31 |
| Residual income to equity | -5 | 3 | 1 | -1 | 7 | 11 | 18 | 21 | 17 to 19 |

F = Forecast.

paying a higher interest rate have fared correspondingly worse, unless they have been earning an exceptionally high rate of return on their assets. However, cash flow after interest (\$1982) in 1987 and 1988 is forecast to rise to the high \$30's from the 1984-86 average of \$29 billion. Growth in real cash flow after interest to levels earned in the 1970 to 1971 preboom period reflects decreased capital expenditures and lower interest expenses (table 11).

Since 1980, returns to farm assets have grown whereas net cash flow has declined somewhat (figure 20). This is primarily because the change in value of loans

Figure 20

Farm Debt Compared with Income Flows to Farm Assets

\$ billion

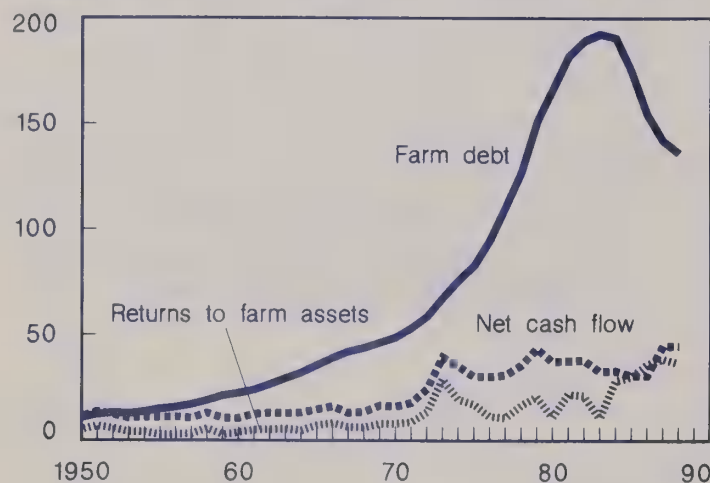
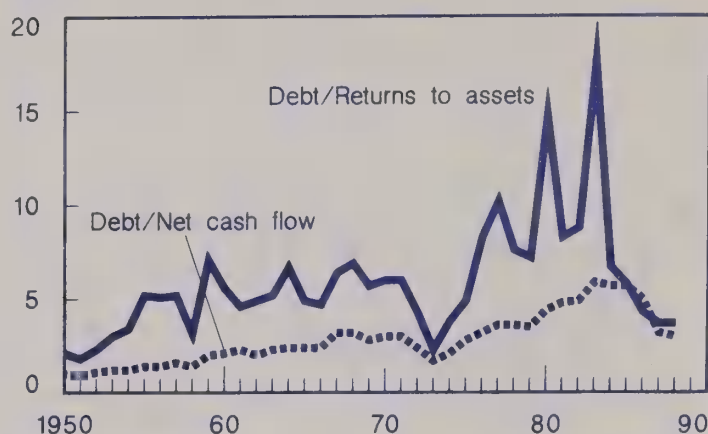


Figure 21

Farm Debt Compared with Returns to Assets and Net Cash Flow

Ratio



Debt excludes operator households. Net cash flow equals gross cash income minus total operating expenses.

outstanding has fallen by \$4 billion per year, and interest payments have averaged \$18 billion per year (\$1982) (table 11). These items are not deducted from returns to farm assets. On balance, farmers have been repaying principal and interest on existing loans (decreasing cash flow), rather than taking out new loans (increasing cash flow). Debt/net cash flow and debt/returns to farm assets are expected to decline further in 1987 and 1988 (figure 21), suggesting that farmers are getting their balance sheets in order, are paying off debt, are financing purchases with available cash, and are in a stronger financial position than at any time in the last several years.

Table 11--Flow of funds to farm sector, selected years 1/

| Item | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987F | 1988F |
|---|------|------|------|------|------|------|------|-------|------------|
| Billion 1982 dollars | | | | | | | | | |
| Gross cash income | 167 | 155 | 151 | 145 | 144 | 141 | 133 | 135 | 125 to 135 |
| Plus: Change in loans outstanding | 18 | 16 | 7 | 3 | -2 | -14 | -18 | -11 | -4 to -6 |
| Plus: Net rent to nonoperator landlords | 7 | 6 | 6 | 5 | 8 | 7 | 6 | 6 | 5 to 7 |
| Plus: Net change in farmers' currency and demand deposits | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
| Minus: Gross cash expenses (excluding interest) | 110 | 100 | 92 | 89 | 89 | 82 | 73 | 72 | 72 to 76 |
| Minus: Capital expenditures | 21 | 18 | 13 | 12 | 12 | 9 | 8 | 7 | 7 to 9 |
| Equals: Cash flow before interest payments | 62 | 61 | 59 | 51 | 50 | 44 | 41 | 52 | 50 to 54 |
| Less: Interest payments | 18 | 20 | 21 | 20 | 19 | 16 | 14 | 13 | 11 to 13 |
| Equals: Cash flow after interest payments | 44 | 40 | 38 | 32 | 31 | 28 | 27 | 39 | 38 to 42 |

F = Forecast. 1/ Numbers may not add because of rounding.

GENERAL ECONOMY

The U.S. financial system has become more internally integrated and at the same time, more tightly linked with the rest of the world. This carries two important implications for interest rates faced by the agricultural sector. First, movements in market-determined agricultural interest rates will closely follow movements in economywide interest rates. Secondly, because the general level of interest rates in the United States responds to international forces, agricultural borrowers and lenders will have to be more aware of international developments, more so than a short 10 years ago.

Roughly, the general level of economywide interest rates is determined by how fast the economy is expanding, how high an inflation rate is expected, and whether the Federal Reserve is expanding or contracting the money supply. A faster expanding economy is usually associated with rising economywide interest rates, and an expectation of faster inflation usually pushes up interest rates too. An expanding money supply is usually associated with lower interest rates, at least in the short run. Of course, the three major determining factors are related. A faster expanding economy usually raises the level of expected inflation, and many analysts believe that faster money supply growth also eventually increases inflation.

Most recent indicators suggest that economywide interest rates, and, by implication, agricultural interest rates, will be rising slightly in the near term. Real GNP expanded at a 4.8-percent rate in the fourth quarter of 1987, and a 2.3-percent rate in the first quarter. One of the driving forces behind the strong growth has been business capital spending, which rose more than 20 percent in real terms at an annual rate in the first quarter of 1988. Real GNP is expected to continue growing briskly with continued increases in business capital spending and fast export growth. This should put upward pressure on interest rates.

Inflation appears likely to rise slightly over the next few quarters, which will contribute to slowly rising interest rates. The overall Consumer Price Index (CPI) rose 3.6 percent in 1987 and 3.9 percent (annual rate) in the first quarter of this year. The outlook

for a slight rise in the inflation rate rests on two factors: rising import prices and higher rates of capacity utilization. Import prices are rising in response to earlier declines in the value of the dollar. Since the beginning of 1987, the dollar has fallen about 15 percent on a trade-weighted basis, while import prices, excluding oil, rose about 10 percent in the first quarter of 1988. Uncertainty about the ability of oil-producing nations to limit crude oil production, which would tend to drive up oil prices, has added extra volatility to inflation expectations.

Higher capacity utilization rates during the last several months have increased the likelihood of higher prices in the near future. In January 1987, overall capacity utilization stood at 79.2 percent. By April 1988, capacity use jumped more than 3 percentage points, to 82.7 percent, the highest level in the current expansion. Some basic industries like paper and textiles are running at near 100 percent capacity.

Recent monetary policy movements are hard to characterize. Using the broader M2 money supply measure, the money supply grew faster in the first quarter of 1988 than in the last quarter of 1987, easing upward pressure on interest rates. In February, however, Federal Reserve Chairman Greenspan announced a slightly lower target range (4-8 percent) for M2 growth than in previous years. This suggests that the Federal Reserve would be following a slightly tighter policy than in the previous 2 years, when the target range was 5.5 to 8.5 percent. The Federal Reserve does not always hit its targets, however. M2 grew only 3.4 percent in 1987. Thus while the M2 target ranges are slightly lower this year than last, it is likely that M2 will grow faster this year than last. Recent statements by Federal Reserve officials suggest that inflation is a key concern, and that a surge in inflation would be met with a monetary tightening, thus driving up interest rates. To some extent this tightening has already occurred, and bank prime rates rose 50 basis points in mid-May.

Interest rates have been relatively steady since the abrupt drop that occurred after the record stock market decline in October. Three-month Treasury bill rates fell from October's 6.4 percent average to 5.8 percent by the end of the year, and averaged 5.7

percent for April 1988. Longer term rates have risen slightly faster than shorter rates, which suggests to some analysts that market participants expect the inflation rate to be higher in the future. All in all, economywide interest rates are likely to be rising slowly in the near term, putting upward pressure on rates faced by agricultural borrowers.

TAX ISSUES

Farmers Struggle with New Requirement To Capitalize Development Costs

The Tax Reform Act of 1986 represented a major revision of the tax code. Marginal tax rates were greatly reduced and personal exemptions and standard deductions were increased. To achieve these tax reductions, many of the special tax provisions that had eroded the income tax base over the years were eliminated.

The agricultural community generally supported these fundamental reforms of the tax code. However, one feature of the Tax Reform Act, the requirement to capitalize preproductive period expenditures, has caused problems for many farmers.

Prior to the Tax Reform Act of 1986, farmers were allowed to claim immediate tax deductions for expenditures associated with the development of certain capital assets, such as the cost of raising breeding and dairy livestock or for the cost of developing new orchards and vineyards. The ability to deduct expenses before taxable income was earned motivated some investors to make farm investments for the purpose of sheltering income from other sources. Tax-motivated investors were able to take advantage of these provisions, resulting in greater investment in agriculture and lower tax revenues than otherwise would have occurred.

The Tax Reform Act of 1986 addressed this situation by limiting the use of cash accounting, by imposing new passive loss rules, and by enacting uniform capitalization rules. In farming, these uniform capitalization rules apply where the preproductive period is more than 2 years. Under the new rules, farmers have two options. The first is to capitalize preproductive expenses. This means that a

dairy farmer, for example, must maintain detailed records on the various individual expense items for raising each animal or adopt an inventory valuation method which approximates these costs. These capitalized costs are not currently deductible but can only be recovered later as depreciation when the animal goes into production.

The second option allows the farmer to deduct preproductive expenses, but only if a one-time election is made to use a less favorable depreciation schedule for all depreciable farm property and forfeit capital gains treatment for the developed asset. This second option may be a reasonable alternative for those farmers who invest less than \$10,000 in depreciable capital each year, since this level is permitted without any reduction in the depreciation allowance. However, farmers who expect to make substantial investments in depreciable capital may find that longer recovery periods for depreciable farm property and a straight-line rate of depreciation amounting to half the rate available to farmers who do not elect to deduct preproductive expenses will result in a significant increase in taxable income. Thus, while the uniform capitalization rules impose a recordkeeping burden that many farmers find cumbersome, the alternative may be too costly to the farmer in terms of less favorable depreciation as well as the loss of potential favorable capital gains treatment in the future.

Continued concern regarding the complexity of the capitalization requirement promoted a number of proposals for repeal as well as additional efforts by the Internal Revenue Service (IRS) to simplify compliance with the new rule. On March 16, 1988, the IRS issued notice 88-24 regarding the application of the uniform capitalization rules concerning amounts to be capitalized as the cost of raising beef and dairy cattle. This notice provides for a "safe harbor" which allows farmers to comply with the capitalization requirement by capitalizing a specified amount, eliminating the need to allocate individual expense items.

With respect to beef cattle, a farmer electing the safe harbor method must capitalize a total of \$340 per cow over a 3-year period. One-quarter of this amount (\$85) must be capitalized in the year in which the calf is born, one-half (\$170) must be

capitalized in the following tax year, and the remaining one-quarter (\$85) must be capitalized in the second taxable year following the year of birth. The same capitalization scheme applies with respect to dairy cattle, except that a total of \$540 must be capitalized per animal. Thus, the capitalized amounts are \$135, \$270 and \$135 for the first, second, and third years, respectively.

Table 12 illustrates the effect on taxable income of electing the safe harbor for capitalizing the costs associated with raising a dairy cow. Although the net effect on taxable income is zero, taxable income in 1987, 1988, and 1989 are increased considerably. Once the

cow goes into production, the capitalized costs can be recovered through depreciation deductions. However, for a calf born in 1987, these costs would not be fully recovered until 1994.

For most farmers, the safe harbor announcement was issued too late to be considered in their decision to capitalize or to continue to deduct development costs. As a result, farmers who have either elected not to capitalize or have used another capitalization method may adopt the safe harbor method by filing an amended return within 180 days of the date the safe harbor rules were published in the Internal Revenue Bulletin.

Table 12--Impact on taxable income of electing safe harbor for dairy cattle 1/

| Year | Amount Capitalized | Depreciation Deduction | Net Effect | Cumulative Effect |
|-----------------|--------------------|------------------------|------------|-------------------|
| Dollars per cow | | | | |
| 1987 | 135 | | 135 | 135 |
| 1988 | 270 | | 270 | 405 |
| 1989 | 135 | -108 | 27 | 432 |
| 1990 | | -172 | -172 | 260 |
| 1991 | | -104 | -104 | 156 |
| 1992 | | -62 | -62 | 94 |
| 1993 | | -62 | -62 | 32 |
| 1994 | | -32 | -32 | 0 |

1/ Assumes animal begins producing milk in 1989 and is held until fully depreciated.

A NEW APPROACH TO ESTIMATING COP BUDGETS

by
Dargan Glaze

Abstract: A computer model has been developed by ERS to replace the Firm Enterprise Data System (FEDS) budget generator to estimate commodity-level COP budgets. The new model, the Farm-Level Budget Generator (FLBG), uses farm-level data from the Farm Costs and Returns Survey (FCRS). The use of farm-level data rather than State-level averages, enables the FLBG to overcome many of the limitations of the FEDS and to allow more rigorous analyses to be conducted.

Keywords: Cost of production, budget generator

Since the mid 1970's, ERS has used the Firm Enterprise Data System (FEDS) to estimate the cost-of-production (COP) budgets for the major program commodities. The FEDS is a computer model that is generally referred to as a "budget generator." A budget generator is a generic name for a model that estimates average costs of production and "generates" commodity budgets. However, this procedure is not without its methodological shortcomings. This does not imply the estimates from the FEDS are inaccurate, but there are restrictions to the analytical uses of the data and cost estimates. A new approach called the Farm Level Budget Generator (FLBG), an enhancement of the FEDS procedure, currently is being tested as a substitute for the FEDS.

The FEDS uses farm-level data from the Farm Costs and Returns Survey (FCRS) to estimate average State or regional input use and production practices for the survey crop. These data and supplemental average State-level data on input prices, machinery, and irrigation equipment are aggregated to calculate costs which are used to estimate State, regional, and national COP commodity budgets.

There are three major limitations of the FEDS. First, the use of State averages of input use, production practices, and machinery use masks the variation that may exist in the farm-level data. Second, the use of State averages sometimes makes it more difficult to verify the results of the model for mathematical accuracy and precision. This problem is especially true of a very large computer model with substantial data

manipulations, such as the FEDS. For these reasons, the use of a budget generator such as the FEDS for estimating has long been criticized as a "black box" approach, since there are losses of precision or slippages that occur as the data are processed through the model. Third, the number of machinery and equipment items is restricted to a predetermined maximum number, limited only to those items that are most commonly used. The most common machinery and equipment items sometimes are more costly.

The FLBG overcomes some of the limitations encountered with the FEDS. It is an enhanced version of the FEDS that has been specifically designed to use farm-level data and improve mathematical efficiency. Although the approaches are conceptually similar and yield similar results, the FLBG directly accesses the FCRS data, one farm at a time, to estimate a commodity budget for each individual producer. There are three external files that provide data: FCRS dataset (each farm's input mix and production practices), parameter sets (State prices for inputs such as fuels and wages), and machinery and equipment complements (prices, hours of life, repair coefficients, etc.). Once the budget costs are estimated, the budget data from each observation and descriptive data from the survey are stored in a file so that they can be analyzed or aggregated to estimate State, regional, or national budgets.

The major advances made by the FLBG include the following:

- o retains variability that exists at the farm level;

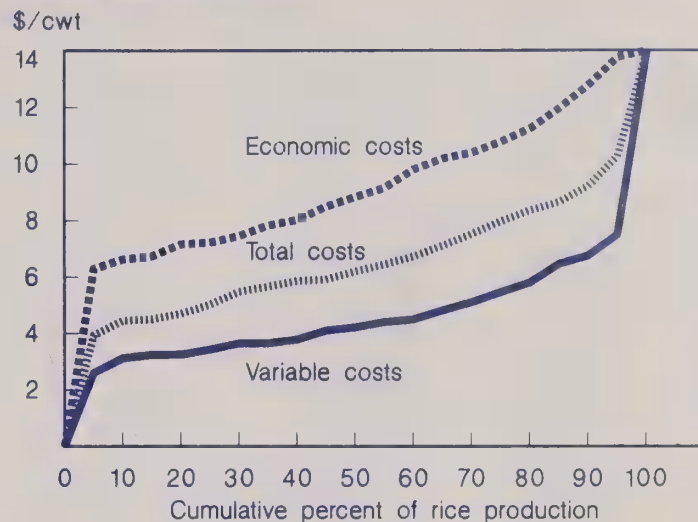
- o improves verification of estimates, since the new model performs calculations for one farm observation at a time, decreasing the "black box" effect;
- o better estimates equipment costs, since the number of equipment items is not restricted and many more types of equipment are considered;
- o produces better overall cost estimates ; and
- o the data can be more rigorously analyzed than was possible previously.

Rice was the first survey crop used as a test for the FLBG. Table 13 shows the results using the two approaches to estimate the cost per planted rice acre for 1984 for the United States. While the results of the FLBG compared closely with those of the FEDS, there are differences in the areas previously discussed. Irrigation expenses are included in fuel and lubrication expense and repair expense on the FEDS budget, while it is a separate budget item on the FLBG. Fuel, lubrication, repairs, and capital replacement expenses are affected by the method for calculating machinery and equipment costs. Labor and purchased water expenses are calculated from survey responses.

These results were presented to producers, researchers, and extension staff from Arkansas, Louisiana, Mississippi, and Texas at a workshop at the Louisiana State University Experiment Station in Crowley, Louisiana, in November 1987. The FLBG approach was regarded favorably by those in attendance. The approach now is being extended to other commodities. Analysis of wheat and soybeans will be completed in the

Figure 22

Distribution of U.S. Rice Production by Cost Measure, 1984



summer and analysis of corn and cotton will be completed in the late fall.

The new approach also makes it possible to examine differences in farm-level costs in relation to farm and operator characteristics, production practices, land tenure, and resource use to answer questions about why these differences exist. Since there is a one-to-one correspondence between estimated farm-level production costs and other descriptive data from the survey, economics of size and cost distributions can be analyzed as shown by table 14 and figure 22, respectively.

The FLBG represents the culmination of a long research effort to improve the COF estimates and budgets and to analyze these data more rigorously. The results from the FLBG will be used in other areas of analyses, such as farm simulation, farm characteristics, and farm financial structure. These analyses will address both current and future challenges confronting U.S. farmers and policymakers.

Table 13--Average rice production cost per planted acre for the United States using the FLBG and FEDS, 1984.

| | FLBG 1/ | FEDS |
|---|---------|--------|
| Cash receipts: | | |
| Primary crop | 409.43 | 393.22 |
| Total | 409.43 | 393.22 |
| Cash expenses: | | |
| Variable: | | |
| Seed | 28.39 | 25.51 |
| Fertilizer | 37.52 | 35.61 |
| Chemical | 5.06 | 5.51 |
| Custom operations | 48.06 | 47.92 |
| Fuel and lube | 11.24 | 38.72 |
| Repair | 11.20 | 28.23 |
| Drying | 32.93 | 32.04 |
| Technical services | 3.09 | 5.24 |
| Irrigation 2/ | 28.88 | -- |
| Hired labor | 23.34 | 15.90 |
| Purchased water | 6.21 | 20.45 |
| Total variable expenses | 235.92 | 255.13 |
| Fixed: | | |
| General farm overhead | 24.21 | 23.67 |
| Taxes and insurance | 7.73 | 12.26 |
| Interest | 56.68 | 54.02 |
| Total fixed expenses | 88.62 | 89.95 |
| Capital replacement | 36.95 | 49.71 |
| Total cash expenses and capital replacement costs | 361.49 | 394.79 |
| Receipts less cash expenses and capital replacement costs | 47.94 | -1.57 |
| Economic (full ownership) costs: | | |
| Variable expenses | 235.92 | 255.13 |
| General farm overhead | 24.21 | 23.67 |
| Taxes and insurance | 7.73 | 12.26 |
| Capital replacement | 36.95 | 49.71 |
| Allocated returns to owned inputs: | | |
| Return to operating capital | 7.73 | 7.88 |
| Return to other non-land capital | 10.81 | 10.12 |
| Net land rent | 93.46 | 68.86 |
| Unpaid labor | 60.81 | 27.07 |
| Total economic costs | 477.62 | 454.70 |
| Residual returns to management and risk | -68.19 | -61.48 |
| Harvest-period price (\$/cwt) 3/ | 8.05 | 8.05 |
| Yield (cwt/planted acre) 4/ | 50.86 | 48.87 |

Source: 1984 Farm Costs and Returns Survey. 1/ These results are preliminary. 2/ Irrigation expenses are included in both fuel and lube expenses and repair expenses for FEDS. 3/ Prices are averages of harvest month prices. 4/ Yields used by FLBG are averages of producer's survey responses and yields used by FEDS are season averages from NASS.

Table 14--Average rice production cost per planted acre by rice acreage for the United States using the FLBG, 1984. 1/

| | <150 acres | 151-300 acres | >300 acres |
|---|------------|---------------|------------|
| Cash receipts | 382.38 | 404.11 | 418.60 |
| Cash Expenses: | | | |
| Variable: | | | |
| Seed | 24.75 | 26.42 | 30.34 |
| Fertilizer | 42.00 | 33.37 | 38.54 |
| Chemical | 8.68 | 3.75 | 4.82 |
| Custom operations | 38.90 | 46.12 | 51.39 |
| Fuel and lube | 10.13 | 11.71 | 11.28 |
| Repair | 9.96 | 10.37 | 11.95 |
| Drying | 26.09 | 29.30 | 36.54 |
| Technical services | 2.93 | 3.56 | 2.89 |
| Irrigation | 33.06 | 31.56 | 26.44 |
| Hired labor | 11.60 | 18.76 | 28.69 |
| Purchased water | 2.81 | 4.46 | 7.98 |
| Total variable expenses | 210.91 | 219.38 | 250.86 |
| Fixed: | | | |
| General farm overhead | 26.11 | 22.63 | 24.56 |
| Taxes and insurance | 7.94 | 8.10 | 7.49 |
| Interest | 40.12 | 65.70 | 56.19 |
| Total fixed expenses | 74.17 | 96.43 | 88.24 |
| Capital replacement | 38.07 | 36.02 | 37.15 |
| Total cash expenses and capital replacement costs | 323.15 | 351.83 | 376.25 |
| Receipts less cash expenses and capital replacement costs | 59.23 | 52.28 | 42.53 |
| Economic (full ownership) costs: | | | |
| Variable expenses | 210.91 | 219.38 | 250.86 |
| General farm overhead | 26.11 | 22.63 | 24.56 |
| Taxes and insurance | 7.94 | 8.10 | 7.49 |
| Capital replacement | 38.07 | 36.02 | 37.15 |
| Allocated returns to owned inputs: | | | |
| Return to operating capital | 6.89 | 7.18 | 8.22 |
| Return to other non-land capital | 23.63 | 13.13 | 6.37 |
| Net land rent | 84.22 | 89.06 | 98.08 |
| Unpaid labor | 57.50 | 64.74 | 59.60 |
| Total economic costs | 455.27 | 460.24 | 492.92 |
| Residual returns to management and risk | -72.89 | -56.13 | -73.55 |
| Harvest-period price (\$/cwt) 2/ | 8.05 | 8.05 | 8.05 |
| Yield (cwt/planted acre) 3/ | 47.50 | 50.20 | 52.00 |

Source: 1984 Farm Costs and Returns Survey. 1/ These results are preliminary.
 2/ Prices are averages of harvest month prices. 3/ Yields are averages of producer's survey responses.

RATES OF RETURN ON FARM ASSETS: A COMPARISON OF ALTERNATIVE PROFITABILITY MEASURES

by
Kenneth Erickson

Abstract: In periods of rapidly changing farm income and land values, the net real return on assets, the total real return on assets, and the total real return on equity may give better estimates of the farm sector's relative profitability than traditional measures such as the rate of return on assets, the rate of return on equity, and the net return on assets. There is substantially less understatement of the sector's profitability during upswings, since the real capital gains component of total returns is included.

Keywords: Profitability, rate of return, capital gains

The profitability of U.S. agriculture can be described with various financial measures. Each emphasizes a different aspect of profitability, and can therefore lead to different conclusions concerning overall financial performance of the farm sector. Traditionally, farm sector economic well-being has been affected not only by the current level of income, but also by changes in wealth resulting from capital gains and losses on farm assets.

Several alternative farm sector profitability measures are described and compared in this article. Some exclude real capital gains, while others include them. The focus is on present USDA profitability measures which value assets based on the current market rather than on historic costs.

The total rate of return on farm assets (equity) equals the rate of return on current income plus the rate of return on real capital gains. In periods of rapidly changing farm income and land values, such as the 1970's, measures which include capital gains may give better estimates of the farm sector's profitability than those that do not.

The rate of return on assets (ROA), the rate of return on equity (ROE), and the net return on assets (NROA) are widely used indicators of aggregate farm sector profitability (standard computation methods are presented in appendix table 1). The ROA reflects returns per dollar of owned and borrowed capital and is the ratio of residual income (including interest paid) to farm assets.

The ROE reflects returns per dollar of owned capital only and is the ratio of residual income (excluding interest paid) to farm equity. The NROA is defined as the difference between the average return per dollar of owned and borrowed capital and the average cost of borrowing (ROA minus average interest rate paid on farm debt).

Relative measures of profitability such as the ROA, unlike absolute measures such as returns to farm assets, estimate profitability relative to the resources committed to earn those profits. Therefore, relative measures reveal more about how efficiently managers are using farm assets. However, these current market value-based rates of return should be used cautiously, since the measures of income and equity can be questioned on the basis of accounting validity and economic relevance (1).

Effect of Capital Gains on Profitability

Farm programs and macroeconomic policy changes affect both the short-term (current) return on farm assets and the wealth of farm asset holders. Changes in expectations about income growth or interest rates can cause large changes in asset values and in real capital gains. Also, capital has substituted for both land and labor, substantially raising the level of net returns attributable to capital. The changed current and expected returns are capitalized into the value of fixed assets, such as land. This led (until 1982) to higher farmland values even with some reduction of

returns to farm assets. Including returns from real capital gains or losses gives a more volatile series, with higher returns in the 1970's but lower returns throughout most of the 1980's.

Including Capital Gains in Total Returns

Aukes criticizes the practice of including returns from real capital gains in total returns (2). He believes that combining the income share (an accounting concept) and the capital gains share (an economic concept) represents "double-counting" income because it views income both as a realization (the income share) and as an expectation (the capital gains share).

Melichar argues that since the price of farm assets reflects real capital gains due to expected future income growth, those gains should be included in computations of the total returns to farm assets (3).

The expected annual income increases and the real capital gains they generate substitute for current income in satisfying the required rate of return. Investors establish a required rate of return as their bids reflect their knowledge of the rates of return available on alternative investments, adjusted for differences in risk. The required return or discount rate determines the total rate of return, and the growth of current returns to farm assets determines how the total return is divided between returns from current income and returns from capital gains.

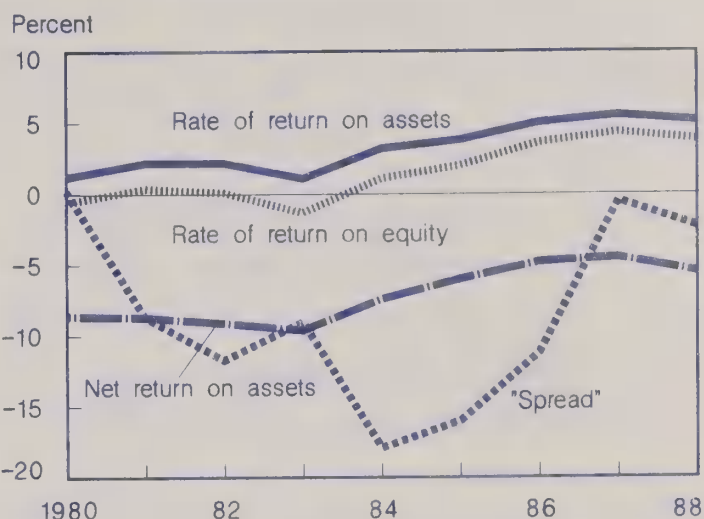
Hottel and Gardner have also argued (4, p. 557) that ERS should either (1) include interest costs on real estate in an amount equivalent to the real rate of interest, but exclude real capital gains as income, or (2) continue to include all interest costs (including "real" and expected rates of inflation in the interest expense calculations) and include capital gains or losses as a component of income.

Profitability Measures Which Exclude Real Capital Gains

The ROA, the ROE, and the NROA exclude the real capital gains component of total returns (figure 23). Also, the NROA does not adjust borrowing costs for inflation. Therefore, they can understate (overstate) the

Figure 23

Profitability Ratios



relative profitability of agriculture in periods of changing asset values.

For example, in the 1970's (rising values) and the 1980's (declining values), a large portion of the total returns to farm assets was due to unrealized capital gains associated with changing land values rather than to realized gains associated with increased cash flow (table 15).

This understatement of the relative profitability during periods of changing assets values is clearly illustrated by the net return on assets (NROA) for 1970-86. During this period, the NROA was positive only for 1973. This suggests that the benefit or return from use of borrowed capital exceeded the cost of borrowing only in 1973 and that debt financing was only profitable for that year.

Profitability Measures Which Include Real Capital Gains

The total-real-rates-of-return measures of profitability and the "spread" include the real capital gains component of total returns. The spread has been defined as the total real return on assets minus the real cost of debt (5, pp. 10-11) (Appendix table 1). It includes both real capital gains and the current rate of return on assets, but is net of the real cost of borrowing (average interest rate paid on debt less return from real capital gains on debt).

Table 15--Farm sector returns, assets, and rates of return measures, 1970-86

| Item | Average for period | | | 1986 |
|--|--------------------|---------|---------|-------|
| | 1970-74 | 1975-79 | 1980-85 | |
| Billions of 1982 dollars | | | | |
| <u>Farm sector returns:</u> | | | | |
| Gross farm income (excluding operator households) | 155.2 | 162.6 | 150.3 | 131.3 |
| Returns to farm assets | 32.7 | 22.8 | 20.4 | 31.7 |
| Real capital gains on farm assets | 27.1 | 65.0 | -47.1 | -62.1 |
| <u>Farm sector assets:</u> | 690.8 | 932.5 | 936.4 | 631.8 |
| <u>Rates of return measures:</u> | | | | |
| Percent | | | | |
| Total real return on assets | 8.6 | 9.5 | -5.2 | -3.7 |
| ROA | 4.6 | 2.5 | 2.3 | 5.0 |
| Real capital gains | 4.0 | 7.0 | -7.5 | -8.7 |
| Total real return on equity | 10.2 | 11.1 | -8.0 | -7.0 |
| ROE | 4.2 | 1.4 | -0.4 | 3.6 |
| Real capital gains | 6.0 | 9.8 | -8.3 | -10.6 |
| Net return on assets (NROA) | -2.5 | -6.5 | -8.2 | -4.8 |
| Spread (net real return on assets) | 7.3 | 7.5 | -10.7 | -11.2 |

When the spread is positive, debt financing is profitable.

During the 1972-75 and 1978-79 booms, use of debt financing was highly profitable. As figure 4 indicates, the total real return on farm assets during the 1970's far exceeded the real cost of farm debt (interest rate less the general rate of inflation). Although the low real cost of debt (borrowing) was an incentive to increase borrowing, the increased total real return of owning farm assets was the main impetus (5, p. 10).

Whereas the NROA indicates that debt financing was profitable only for 1973, the spread indicates that, for the farm sector, the benefit from debt financing exceeded the cost of borrowing throughout the 1970's and through 1980.

1987 and 1988 Farm Sector Profitability Forecasts

Stable to rising land values, supported by farm income recovery, are important

indicators that the agricultural economy has turned the corner. The 3-percent increase in farm real estate values and modestly rising returns to farm assets have resulted in the ROA increasing from 5.0 percent in 1986 to 5.5 percent in 1987 and remaining in the 4- to 6-percent range for 1988. As the expected annual income increases are small, returns on current income are substituting for returns on real capital gains in satisfying the required return on farm investments. The ROE is also estimated to have risen from 3.6 percent in 1986 to 4.3 percent in 1987, as returns to equity rise faster than farm equity, and to remain stable at 3 to 5 percent for 1988. The NROA rose slightly from -4.8 percent in 1986 to -4.4 percent in 1987, and is expected to fall slightly to -5 to -6 in 1988 (table 16).

Rising residual income to farm assets and rising asset values led to real capital gains in 1987. Therefore, the total real return on assets and total real return on equity are forecast to rise from 1986 as negative rates of return from real capital losses were eliminated in 1987. Total real rates of return on assets and on equity are likely to be lower

Table 16--Rates of return, excluding and including real capital gains, 1986-88

| Profitability measures | 1986 | 1987F | 1988F |
|------------------------------------|---------|-------|----------|
| <hr/> | | | |
| <u>Exclude real capital gains</u> | Percent | | |
| ROA | 5.0 | 5.5 | 4 to 6 |
| ROE | 3.6 | 4.3 | 3 to 5 |
| Net returns on assets (NROA) | -4.8 | -4.4 | -5 to -6 |
| ROA | 5.0 | 5.5 | 4 to 6 |
| Average interest rate paid on debt | 9.8 | 10.0 | 9 to 11 |
| <hr/> | | | |
| <u>Include real capital gains</u> | | | |
| Total real return on assets | -3.7 | 5.6 | 5 to 6 |
| ROA | 5.0 | 5.5 | 4 to 6 |
| Real capital gains | -8.7 | 0.0 | 0 to 1 |
| Total real return on equity | -7.0 | 5.5 | 4 to 5 |
| ROE | 3.6 | 4.3 | 3 to 5 |
| Real capital gains | -10.6 | 1.1 | 0 to 2 |
| Total real cost of debt | 7.5 | 6.0 | 7 to 9 |
| Average interest rate paid on debt | 9.8 | 10.0 | 9 to 11 |
| Real capital gains | 2.3 | 3.9 | 2 to 4 |
| Spread (net real return on assets) | -11.2 | -0.4 | -2 to -3 |
| Total real return on assets | -3.7 | 5.6 | 5 to 6 |
| Total real cost of debt | 7.5 | 6.0 | 7 to 9 |

F = Forecast. Totals may not add because of rounding.

in 1988 than in 1987 because of slightly higher projected real capital losses on farm assets.

Although the NROA rose slightly from -4.8 percent in 1986 to -4.4 in 1987, the spread rose from -11.2 percent to -0.4. This suggests that the farm sector's overall financial performance was considerably better than the NROA indicated. The rise in the spread from its low negative values in 1984-86 to -0.4 percent in 1987 was primarily due to decreased real capital losses and a lower real cost of borrowing. The change in the spread to -2 to -3 percent in 1988 may reflect an increase in the interest rate spread (average lending rate less banks' costs), and lower real capital gains on debt, which raise real borrowing costs (table 16).

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Appendix table 1--Farm income, assets and debt, and returns 1/

| Item | 1984 | 1985 | 1986 | 1987F | 1988F |
|---|-------|-------|-------|-------|------------|
| Billion dollars | | | | | |
| Income and total returns | | | | | |
| 1. Gross farm income 2/ | 163 | 155 | 150 | 155 | 150 to 165 |
| 2. Wages and perquisites to hired labor | 9 | 9 | 9 | 9 | 8 to 10 |
| 3. Other operating expenses, excluding interest | 80 | 76 | 69 | 69 | 69 to 77 |
| 4. Capital consumption | 19 | 17 | 16 | 15 | 13 to 15 |
| 5. Net income from assets and operators' labor and management (1-2-3-4) | 55 | 54 | 56 | 63 | 58 to 64 |
| 6. Income imputed to operators' labor and management | 27 | 23 | 20 | 24 | 24 to 26 |
| 7. Residual income to assets (5-6) | 28 | 30 | 36 | 38 | 34 to 38 |
| 8. Real capital gain to assets | -124 | -106 | -63 | -6 | -24 to -26 |
| 9. Total return from assets (7+8) | -96 | -76 | -27 | 33 | 10 to 12 |
| 10. Interest paid | 20 | 18 | 16 | 15 | 14 to 16 |
| 11. Real capital gain to debt | 6 | 6 | 4 | 6 | 3 to 5 |
| 12. Total return to equity (9-10+11) | -110 | -88 | -39 | 24 | -1 to 0 |
| 13. Real capital gain to assets and debt | -118 | -100 | -59 | 0 | -20 to -22 |
| 14. Residual income to equity (12-13) | 8 | 12 | 20 | 24 | 20 to 22 |
| Balance sheet 3/ | | | | | |
| 15. Assets | 849 | 750 | 692 | 714 | 725 to 735 |
| 16. Debt | 191 | 175 | 155 | 143 | 132 to 142 |
| 17. Equity (15-16) | 658 | 575 | 537 | 571 | 590 to 600 |
| Percent | | | | | |
| Rates of return and interest rates | | | | | |
| 18. Rate of return on assets (ROA) (7/15) | 3.2 | 3.8 | 5.0 | 5.5 | 4 to 6 |
| 19. Real capital gain on assets (8/15) | -13.8 | -13.3 | -8.7 | 0.0 | 0 to 1 |
| 20. Total real return on assets (18+19) | -10.7 | -9.5 | -3.7 | 5.6 | 5 to 6 |
| 21. Av. interest rate paid on debt (10/16) | 10.6 | 9.8 | 9.8 | 10.0 | 10 to 11 |
| 22. Real capital gains on debt (11/16) | 3.4 | 3.3 | 2.3 | 3.9 | 2 to 3 |
| 23. Real cost of debt (21-22) | 7.2 | 6.5 | 7.5 | 6.0 | 7 to 8 |
| 24. Rate of return on equity (ROE) ((7-10)/17) | 1.1 | 2.0 | 3.6 | 4.3 | 3 to 4 |
| 25. Real capital gain on equity ((8+11)/17) | -16.7 | -16.3 | -10.6 | 1.1 | 0 to 2 |
| 26. Total real return on equity (24+25) | -15.5 | -14.3 | -7.0 | 5.5 | 4 to 5 |
| 27. Net return on assets (NRQA) (18-21) | -7.4 | -6.0 | -4.8 | -4.4 | -5 to -6 |
| 28. Spread (20-23) 4/ | -17.9 | -16.0 | -11.2 | -0.4 | -2 to -3 |

F = Forecast. 1/ Numbers may not add due to rounding. 2/ Excludes operator dwellings. 3/ Excludes operator households and CCC activity. 4/ When total real rate of return on assets exceeds total real cost of debt, debt financing is profitable.

Appendix table 2--Farm income and cash flow statement, 1983-88

| Item | 1983 | 1984 | 1985 | 1986 | 1987F | 1988F |
|-------------------------------------|-------|-------|-------|-------|-------|------------|
| Billion dollars | | | | | | |
| Farm income sources: | | | | | | |
| 1. Cash receipts | 136.6 | 142.3 | 144.2 | 135.2 | 136 | 138 to 142 |
| Crops 1/ | 67.1 | 69.4 | 74.4 | 63.6 | 61 | 64 to 66 |
| Livestock | 69.4 | 72.9 | 69.8 | 71.6 | 75 | 74 to 76 |
| Cash Government payments | 4.1 | 4.0 | 7.6 | 8.1 | 7 | 6 to 8 |
| Value of PIK commodities | 5.2 | 4.5 | 0.1 | 3.7 | 10 | 6 to 8 |
| 2. Direct Government payments | 9.3 | 8.4 | 7.7 | 11.8 | 17 | 13 to 15 |
| 3. Farm-related income 2/ | 4.5 | 4.4 | 5.0 | 5.1 | 5 | 4 to 6 |
| 4. Gross cash income(1+2+3) 3/ | 150.4 | 155.1 | 156.9 | 152.0 | 158 | 157 to 161 |
| 5. Nonmoney income 4/ | 13.5 | 13.4 | 11.8 | 10.8 | 10 | 8 to 10 |
| 6. Realized gross income (4+5) | 163.9 | 168.5 | 168.7 | 162.8 | 168 | 166 to 171 |
| 7. Value of inventory change | -10.9 | 6.2 | -2.7 | -3.3 | -3 | 0 to 1 |
| 8. Total gross income (6+7) | 153.1 | 174.7 | 166.0 | 159.5 | 165 | 166 to 171 |
| Production expenses: | | | | | | |
| 9. Cash expenses 5/ 6/ | 113.3 | 116.3 | 109.6 | 100.1 | 100 | 101 to 105 |
| 10. Total expenses | 140.4 | 142.7 | 133.7 | 122.1 | 120 | 121 to 125 |
| Income statement: | | | | | | |
| Net cash income: 1/ 6/ | | | | | | |
| 11. Nominal (4-9) | 37.1 | 38.8 | 47.3 | 52.0 | 57 | 50 to 55 |
| Deflated (1982\$) 7/ | 35.7 | 36.0 | 42.5 | 45.6 | 50 | 43 to 47 |
| Net farm income: 1/ | | | | | | |
| 12. Nominal total net (8-10) | 12.7 | 32.0 | 32.3 | 37.5 | 45 | 40 to 45 |
| Deflated (1982\$) 7/ | 12.2 | 29.7 | 29.1 | 32.9 | 38 | 34 to 38 |
| Deflated (1967\$) 8/ | 4.3 | 10.3 | 10.0 | 11.4 | 13 | 10 to 14 |
| 13. Off-farm income | 37.0 | 38.3 | 42.5 | 44.7 | 48 | 48 to 50 |
| Other sources and uses of funds: | | | | | | |
| 14. Change in loans | | | | | | |
| outstanding 6/ | 3.2 | -1.9 | -15.6 | -20.3 | -13 | -4 to -6 |
| Real estate | 2.3 | -1.1 | -6.0 | -9.6 | -8 | -2 to -4 |
| Nonreal estate 9/ | 0.9 | -0.8 | -9.6 | -10.7 | -5 | -2 to -4 |
| 15. Rental income and monetary chng | 5.3 | 3.9 | 8.8 | 7.8 | 8 | 8 to 10 |
| 16. Gross cash flow (11+14+15) | 45.6 | 45.8 | 40.5 | 39.5 | 54 | 55 to 60 |
| 17. Capital expenditures 6/ | 12.7 | 12.5 | 9.6 | 8.6 | 8 | 9 to 11 |
| 18. Net cash flow 1/ 6/ (16-17): | 32.9 | 33.3 | 30.9 | 30.9 | 46 | 45 to 50 |

F = Forecast. Totals may not add due to rounding. 1/ Includes net CCC loans. 2/ Income from custom work, machine hire, farm recreational activities, forest product sales, and misc. sources. 3/ Numbers in parentheses indicate components required to calculate a given item. 4/ Value of home consumption of farm products and imputed rental value of farm dwellings. 5/ Excludes depreciation and hired labor perquisites. 6/ Excludes farm households. 7/ Deflated by the GNP implicit price deflator. 8/ Deflated by the CPI-U. 9/ Excludes CCC loans.

Appendix table 3--Relationship of net cash to net farm income

| Item | 1983 | 1984 | 1985 | 1986 | 1987F | 1988F |
|---------------------------------|-----------------|-------|-------|-------|-------|------------|
| | Billion dollars | | | | | |
| Gross cash income | 150.4 | 155.1 | 156.9 | 152.0 | 158 | 157 to 161 |
| Minus: cash expenses | 113.3 | 116.3 | 109.6 | 100.1 | 100 | 101 to 105 |
| Equals: Net cash income | 37.1 | 38.8 | 47.3 | 52.0 | 57 | 50 to 55 |
| Plus: Nonmoney income: | | | | | | |
| Gross rental value of dwelling: | 12.5 | 12.3 | 10.9 | 9.9 | 9 | 8 to 9 |
| Value of home consumption | 1.1 | 1.1 | 0.9 | 0.9 | 1 | 0 to 1 |
| Value of inventory change | -10.9 | 6.2 | -2.7 | -3.3 | -3 | 0 to 1 |
| Minus: Noncash expenses: | | | | | | |
| Depreciation & capital consump: | 23.9 | 23.1 | 20.9 | 19.0 | 18 | 15 to 17 |
| Labor perquisites | 0.7 | 0.8 | 0.8 | 0.6 | 1 | 0 to 2 |
| Minus: Household expenses: | | | | | | |
| Interest | 0.9 | 0.9 | 0.8 | 0.7 | 0.6 | 0 to 2 |
| Taxes | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 | 0 to 1 |
| Repairs | 0.4 | 0.4 | 0.5 | 0.5 | 0.3 | 0 to 2 |
| Insurance | 0.9 | 0.9 | 0.9 | 0.9 | 0.9 | 0 to 2 |
| Equals: Net farm income | 12.7 | 32.0 | 32.3 | 37.5 | 45 | 40 to 45 |

F = Forecast.

Appendix table 4--Cash receipts, 1983-88

| Item | 1983 | 1984 | 1985 | 1986 | 1987F | 1988F |
|---------------------------|-------|-------|-------|-------|-------|------------|
| Billion dollars | | | | | | |
| Crop receipts 1/ | | | | | | |
| Food grains | 9.7 | 9.6 | 9.1 | 5.9 | 5 | 6 to 8 |
| Wheat | 8.8 | 8.5 | 7.9 | 5.2 | 5 | 4 to 6 |
| Rice | 0.9 | 1.0 | 1.1 | 0.7 | 1 | 0 to 2 |
| Feed grains and hay | 15.5 | 15.8 | 22.5 | 17.8 | 13 | 11 to 13 |
| Corn | 10.9 | 10.7 | 16.8 | 13.3 | 9 | 7 to 9 |
| Sorghum, barley, and oats | 2.5 | 2.8 | 3.3 | 2.4 | 2 | 1 to 3 |
| Hay (all) | 2.2 | 2.3 | 2.3 | 2.1 | 2 | 1 to 3 |
| Oil crops | 13.5 | 13.9 | 12.6 | 10.5 | 11 | 12 to 14 |
| Soybeans | 12.2 | 12.2 | 11.3 | 9.2 | 10 | 10 to 12 |
| Peanuts | .8 | 1.2 | 1.0 | 1.1 | 1 | 1 to 2 |
| Cotton lint and seed | 3.7 | 3.3 | 3.7 | 2.9 | 4 | 4 to 6 |
| Tobacco | 2.8 | 2.8 | 2.7 | 1.9 | 2 | 1 to 3 |
| Fruits and nuts | 6.1 | 6.8 | 6.8 | 6.9 | 8 | 7 to 9 |
| Vegetables | 8.5 | 9.1 | 8.6 | 8.7 | 9 | 8 to 10 |
| Greenhouse & nursery | 4.5 | 5.2 | 5.5 | 5.8 | 6 | 5 to 7 |
| Other crops 1/ | 3.4 | 3.3 | 3.2 | 3.4 | 3 | 2 to 4 |
| TOTAL CROPS | 67.1 | 69.4 | 74.4 | 63.6 | 61 | 64 to 66 |
| Livestock receipts | | | | | | |
| Red meats | 38.9 | 40.8 | 38.6 | 39.1 | 45 | 42 to 46 |
| Cattle | 26.7 | 28.7 | 27.0 | 26.9 | 32 | 30 to 34 |
| Calves | 2.0 | 2.0 | 2.1 | 2.1 | 2 | 1 to 3 |
| Hogs | 9.8 | 9.7 | 9.0 | 9.7 | 10 | 9 to 10 |
| Sheep and lambs | 0.4 | 0.5 | 0.5 | 0.5 | 1 | 0 to 2 |
| Poultry and eggs | 10.0 | 12.2 | 11.2 | 12.7 | 11 | 11 to 13 |
| Broilers | 4.9 | 6.0 | 5.7 | 6.8 | 6 | 5 to 7 |
| Turkeys | 1.3 | 1.7 | 1.8 | 2.0 | 2 | 1 to 3 |
| Eggs | 3.4 | 4.1 | 3.3 | 3.5 | 3 | 2 to 4 |
| Other poultry | 0.4 | 0.4 | 0.4 | 0.4 | 0 | -1 to 1 |
| Dairy products | 18.8 | 17.9 | 18.1 | 17.8 | 18 | 15 to 20 |
| Wholesale milk 2/ | 18.5 | 17.7 | 17.8 | 17.6 | 17 | 15 to 20 |
| Retail milk | 0.3 | 0.3 | 0.3 | 0.3 | 0 | -1 to 1 |
| Other livestock | 1.8 | 2.0 | 1.9 | 1.9 | 2 | 1 to 3 |
| TOTAL LIVESTOCK | 69.4 | 72.9 | 69.8 | 71.6 | 75 | 74 to 76 |
| TOTAL RECEIPTS | 136.6 | 142.3 | 144.2 | 135.2 | 136 | 138 to 142 |
| Program 3/ | 62.9 | 62.2 | 67.6 | 56.3 | 53 | 55 to 60 |
| Non-program 4/ | 73.7 | 80.2 | 76.6 | 78.9 | 83 | 80 to 85 |

F = Forecast. Totals may not add due to rounding. 1/ Includes sugar, seed, and other misc. crops. 2/ Milk receipts do not reflect price deductions levied on marketings. 3/ Receipts from commodities directly supported by farm programs. 4/ Commodities not receiving direct support.

Appendix table 5--Farm income distribution by enterprise type 1/

| Item | Crop Farms | Cash Grain 2/ | Tobacco | Cotton | Fruit, Nut, Vegetables | Livestock Farms | Red Meat | Dairy | Poultry |
|--------------------------|-----------------|------------------|---------|--------|---------------------------|--------------------|-------------|--------|---------|
| Number of farms | Thousands | | | | | | | | |
| 1986 | 887 | 472 | 80 | 21 | 100 | 1,327 | 868 | 229 | 27 |
| 1987F | 871 | 463 | 79 | 21 | 98 | 1,303 | 852 | 225 | 27 |
| 1988F | 847 | 451 | 77 | 21 | 95 | 1,268 | 829 | 219 | 26 |
| 1. Cash receipts: | Million dollars | | | | | | | | |
| Crops | | | | | | | | | |
| 1986 | 57,172 | 24,661 | 1,698 | 2,921 | 15,072 | 6,420 | 4,961 | 953 | 71 |
| 1987F | 54,000 | 19,000 | 1,500 | 3,300 | 16,000 | 5,400 | 4,200 | 800 | 100 |
| 1988F | 59,000 | 23,000 | 1,600 | 4,100 | 17,000 | 6,100 | 4,800 | 900 | 100 |
| Livestock | | | | | | | | | |
| 1986 | 4,743 | 3,620 | 130 | 48 | 168 | 66,765 | 31,892 | 19,911 | 11,866 |
| 1987F | 5,200 | 4,000 | 100 | 50 | 200 | 70,000 | 35,000 | 20,000 | 11,000 |
| 1988F | 5,000 | 4,000 | 100 | 50 | 200 | 70,000 | 36,000 | 19,000 | 11,000 |
| 2. Direct Gov't payments | | | | | | | | | |
| 1986 | 8,423 | 6,911 | 52 | 696 | 71 | 3,393 | 2,503 | 735 | 18 |
| 1987F | 12,000 | 10,000 | 100 | 900 | 100 | 5,000 | 4,000 | 1,000 | 30 |
| 1988F | 10,000 | 8,000 | 70 | 700 | 100 | 4,000 | 3,000 | 800 | 20 |
| 3. Gross cash income 3/ | | | | | | | | | |
| 1986 | 71,957 | 36,086 | 1,906 | 3,746 | 15,581 | 80,012 | 41,603 | 21,901 | 12,145 |
| 1987F | 74,000 | 35,000 | 2,000 | 4,300 | 18,000 | 83,000 | 45,000 | 23,000 | 11,000 |
| 1988F | 76,000 | 36,000 | 2,000 | 5,000 | 17,000 | 84,000 | 46,000 | 22,000 | 11,000 |
| 4. Cash expenses | | | | | | | | | |
| 1986 | 45,191 | 24,678 | 1,176 | 2,462 | 7,769 | 54,863 | 30,226 | 16,889 | 3,010 |
| 1987F | 44,000 | 24,000 | 1,000 | 2,000 | 8,000 | 55,000 | 31,000 | 16,000 | 3,000 |
| 1988F | 45,000 | 24,000 | 1,000 | 2,000 | 8,000 | 56,000 | 31,000 | 17,000 | 3,000 |
| Net Cash Income: | | | | | | | | | |
| 5. Current dollars 4/ | | | | | | | | | |
| 1986 | 26,765 | 11,407 | 730 | 1,284 | 7,813 | 25,149 | 11,377 | 5,012 | 9,135 |
| 1987F | 30,000 | 11,000 | 700 | 2,000 | 9,000 | 29,000 | 15,000 | 6,000 | 8,000 |
| 1988F | 30,000 | 11,000 | 700 | 3,000 | 9,000 | 28,000 | 15,000 | 5,000 | 8,000 |
| 6. Deflated (1982 \$) | | | | | | | | | |
| 1986 | 23,458 | 9,998 | 640 | 1,125 | 6,847 | 22,041 | 9,971 | 4,393 | 8,006 |
| 1987F | 25,000 | 9,000 | 600 | 1,600 | 8,500 | 24,000 | 12,000 | 5,000 | 7,000 |
| 1988F | 26,000 | 10,000 | 600 | 2,000 | 8,000 | 21,000 | 11,000 | 4,000 | 6,000 |
| Balance Sheet: | | | | | | | | | |
| 7. Farm assets: | | | | | | | | | |
| Real estate | | | | | | | | | |
| 1986 | 213,218 | 106,609 | 9,182 | 6,988 | 37,135 | 296,873 | 196,538 | 59,936 | 6,733 |
| 1987F | 222,000 | 111,000 | 10,000 | 7,000 | 39,000 | 309,000 | 204,000 | 62,000 | 7,000 |
| 1988F | 254,000 | 142,000 | 10,000 | 7,000 | 39,000 | 313,000 | 207,000 | 63,000 | 7,000 |
| Nonreal estate | | | | | | | | | |
| 1986 | 77,608 | 50,701 | 2,107 | 2,889 | 8,062 | 103,874 | 57,594 | 33,156 | 1,620 |
| 1987F | 76,000 | 50,000 | 2,000 | 3,000 | 8,000 | 103,000 | 57,000 | 33,000 | 1,600 |
| 1988F | 75,000 | 49,000 | 2,000 | 3,000 | 8,000 | 102,000 | 57,000 | 32,000 | 1,600 |
| 8. Total liabilities | | | | | | | | | |
| 1986 | 79,574 | 49,814 | 1,414 | 4,963 | 9,253 | 75,384 | 39,217 | 28,106 | 1,713 |
| 1987F | 72,000 | 45,000 | 1,000 | 5,000 | 8,000 | 68,000 | 36,000 | 26,000 | 1,800 |
| 1988F | 66,000 | 41,000 | 1,000 | 4,000 | 8,000 | 63,000 | 38,000 | 23,000 | 1,700 |
| 9. Debt-to-asset ratio | | | | | Percent | | | | |
| 1986 | 27.4 | 31.7 | 12.5 | 50.3 | 20.5 | 18.8 | 15.4 | 30.2 | 20.5 |
| 1987F | 24.2 | 28.2 | 11.1 | 45.1 | 17.6 | 16.6 | 13.6 | 26.8 | 18.1 |
| 1988F | 20.1 | 21.7 | 10.1 | 41.0 | 15.9 | 15.2 | 12.4 | 24.5 | 16.4 |

F = Forecast. Numbers may not add due to rounding. 1/ Farms types are defined as those with 50 percent or more of all sales accounted for by a specific commodity or commodity group. 2/ Includes farms earning at least half their receipts from sales of wheat, corn, soybeans, rice, sorghum, barley, oats or a mix of cash grains. 3/ Equals a + b + farm related income. 4/ Equals c - d.

Appendix table 6--Farm production expenses, 1983-88

| Item | 1983 | 1984 | 1985 | 1986 | 1987F | 1988F |
|------------------------------------|-------|-------|-------|-------|-------|------------|
| Billion dollars | | | | | | |
| Farm-origin inputs | 33.5 | 32.8 | 30.4 | 28.8 | 30 | 30 to 32 |
| Feed | 21.7 | 19.9 | 18.0 | 16.2 | 16 | 16 to 18 |
| Livestock | 8.8 | 9.5 | 9.0 | 9.6 | 11 | 10 to 12 |
| Seed | 3.0 | 3.4 | 3.4 | 3.0 | 3 | 2 to 3 |
| Manufactured inputs | 20.9 | 21.5 | 20.8 | 17.0 | 16 | 16 to 18 |
| Fertilizer | 7.1 | 7.4 | 7.3 | 5.8 | 5 | 5 to 7 |
| Fuels and oils | 7.5 | 7.1 | 6.6 | 4.8 | 5 | 4 to 6 |
| Electricity | 2.1 | 2.2 | 2.2 | 2.1 | 2 | 2 to 3 |
| Pesticides | 4.2 | 4.8 | 4.8 | 4.3 | 4 | 3 to 4 |
| Total interest charges | 21.4 | 21.1 | 18.7 | 16.9 | 15 | 13 to 15 |
| Short-term interest | 10.6 | 10.4 | 8.8 | 7.8 | 7 | 5 to 6 |
| Real estate interest | 10.8 | 10.7 | 9.9 | 9.1 | 9 | 7 to 8 |
| Other operating expenses | 31.1 | 31.4 | 30.6 | 29.5 | 30 | 30 to 32 |
| Repair and maintenance | 6.5 | 6.4 | 6.4 | 6.4 | 7 | 7 to 8 |
| Labor expenses | 9.7 | 9.7 | 9.8 | 9.9 | 10 | 10 to 12 |
| Machine hire & custom work | 1.9 | 2.2 | 2.2 | 1.8 | 2 | 1 to 2 |
| Animal health | 1.4 | 1.3 | 1.2 | 1.2 | 1 | 1 to 2 |
| Marketing, storage & trans | 3.9 | 4.0 | 4.1 | 3.7 | 4 | 4 to 5 |
| Misc. operating expenses | 7.0 | 7.1 | 6.7 | 6.2 | 6 | 6 to 7 |
| Other overhead expenses | 33.4 | 35.8 | 33.2 | 29.8 | 29 | 27 to 29 |
| Capital consumption | 23.9 | 23.1 | 20.9 | 19.0 | 18 | 15 to 17 |
| Taxes | 4.5 | 4.1 | 4.2 | 4.1 | 4 | 4 to 5 |
| Net rent to nonoperating landlords | 5.1 | 8.6 | 8.1 | 6.7 | 7 | 7 to 8 |
| Total production expenses | 140.4 | 142.7 | 133.7 | 122.1 | 120 | 120 to 125 |
| Interest on oper. dwelling | 0.9 | 0.9 | 0.8 | 0.7 | 1 | 0 to 2 |
| Taxes on operator dwelling | 0.3 | 0.3 | 0.3 | 0.3 | 0 | 0 to 1 |
| Repairs on oper. dwelling | 0.4 | 0.4 | 0.5 | 0.5 | 1 | 0 to 2 |
| Insurance on oper. dwelling | 0.9 | 0.9 | 0.9 | 0.9 | 1 | 0 to 2 |
| Labor perquisites (noncash) | 0.7 | 0.8 | 0.8 | 0.6 | 1 | 0 to 2 |
| Noncash & household expenses | 3.2 | 3.2 | 3.2 | 3.0 | 3 | 2 to 4 |
| Cash expenses 1/ | 113.3 | 116.3 | 109.6 | 100.1 | 100 | 101 to 105 |

F = Forecast. 1/ Cash expenses equal total expenses minus depreciation, operator dwelling expenses, and noncash labor benefits.

Appendix table 7--Balance sheet of the farming sector, excluding operator households, December 31

| Item | 1983 | 1984 | 1985 | 1986 | 1987F | 1988F |
|------------------------------|-----------------|-------|-------|-------|-------|------------|
| | Billion dollars | | | | | |
| Assets: | | | | | | |
| Real estate | 739.6 | 639.6 | 558.9 | 510.1 | 523 | 534 to 544 |
| Nonreal estate: | | | | | | |
| Livestock and poultry | 49.7 | 49.6 | 46.3 | 47.6 | 58 | 57 to 61 |
| Machinery and motor vehicles | 100.8 | 96.9 | 87.7 | 80.4 | 78 | 78 to 82 |
| Crops stored 1/ | 23.7 | 29.6 | 23.1 | 18.4 | 19 | 14 to 18 |
| Financial assets | 31.3 | 32.8 | 34.2 | 35.0 | 37 | 36 to 38 |
| Total nonreal estate | 205.4 | 208.9 | 191.2 | 181.5 | 191 | 188 to 194 |
| Total farm assets | 945.0 | 848.5 | 750.1 | 691.6 | 714 | 725 to 735 |
| Liabilities: | | | | | | |
| Real estate 2/ | 104.8 | 103.7 | 97.7 | 88.1 | 81 | 76 to 80 |
| Nonreal estate | 87.9 | 87.1 | 77.5 | 66.8 | 62 | 56 to 60 |
| Total farm liabilities | 192.7 | 190.8 | 175.2 | 155.0 | 143 | 132 to 142 |
| Total farm equity | 752.3 | 657.7 | 574.9 | 536.6 | 571 | 590 to 600 |
| | Percent | | | | | |
| Selected ratios: | | | | | | |
| Debt-to-asset | 20.4 | 22.5 | 23.4 | 22.4 | 20 | 17 to 20 |
| Debt-to-equity | 25.6 | 29.0 | 30.5 | 28.9 | 25 | 21 to 24 |
| Debt-to-net cash income | 519.2 | 491.7 | 370.6 | 298.1 | 245 | 230 to 247 |

F = Forecast. 1/ Excludes CCC loans. 2/ Includes CCC storage and drying loans.

Appendix table 8--Farm financial ratios: liquidity, solvency, profitability, and financial efficiency

| Farm financial ratios: | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987F | 1988F |
|--|-------|------|------|-------|------|------|------|-------|------------|
| Liquidity ratios: | | | | | | | | | |
| Household debt service coverage 1/ | 2.73 | 2.42 | 2.44 | 2.41 | 2.51 | 3.12 | 3.72 | 4.5 | 4.6 to 4.7 |
| Farm business debt service coverage 2/ | 1.86 | 1.66 | 1.74 | 1.71 | 1.76 | 2.14 | 2.50 | 3.0 | 2.8 to 3.0 |
| Debt servicing 3/ | 0.19 | 0.22 | 0.23 | 0.22 | 0.21 | 0.18 | 0.17 | 0.09 | 0.0 to 0.2 |
| Times interest earned ratio 4/ | 2.23 | 2.57 | 2.26 | 1.80 | 2.71 | 2.96 | 3.46 | 4.2 | 4.2 to 4.4 |
| | | | | | | | | | |
| Solvency ratios: | | | | | | | | | |
| Debt/asset 5/ | 16.7 | 18.3 | 19.7 | 20.4 | 22.5 | 23.4 | 22.4 | 20 | 17 to 20 |
| Debt/equity 6/ | 20.1 | 22.4 | 24.6 | 25.6 | 29.0 | 30.5 | 28.9 | 25 | 21 to 24 |
| Financial leverage index 7/ | -0.47 | 0.16 | 0.03 | -1.12 | 0.36 | 0.53 | 0.72 | 0.8 | 0.7 to 0.8 |
| | | | | | | | | | |
| Profitability ratios: | | | | | | | | | |
| Return on equity 8/ | -0.6 | 0.4 | 0.1 | -1.3 | 1.1 | 2.0 | 3.6 | 4.3 | 3 to 5 |
| Return on assets 9/ | 1.2 | 2.2 | 2.2 | 1.1 | 3.2 | 3.8 | 5.0 | 5.5 | 4 to 6 |
| Net farm to gross cash farm income 10/ | 11.3 | 18.4 | 15.6 | 8.4 | 20.6 | 20.6 | 24.7 | 28 | 27 to 29 |
| | | | | | | | | | |
| Financial efficiency ratios: | | | | | | | | | |
| Gross ratio 11/ | 76.1 | 77.6 | 74.7 | 75.3 | 75.0 | 69.9 | 65.8 | 63 | 60 to 70 |
| Interest to gross cash farm income 12/ | 10.9 | 13.1 | 13.9 | 13.7 | 13.1 | 11.4 | 10.7 | 9 | 8 to 10 |
| Asset turnover 13/ | 15.1 | 14.7 | 15.4 | 15.8 | 17.3 | 19.6 | 21.1 | 23 | 21 to 23 |
| Net cash farm income to debt ratio 14/ | 31.3 | 29.7 | 31.8 | 30.2 | 30.8 | 35.6 | 41.3 | 49 | 49 to 51 |

F = Forecast. 1/ Assesses the ability of farm sector households to repay both principal and interest. 2/ Assesses the ability of farm businesses to repay both principal and interest. 3/ Indicates the proportion of gross cash farm income needed to service debt. 4/ Shows the farm sector's ability to service debt out of net income. 5/ Shows the proportion of all assets that are financed with debt. 6/ Measures the relative proportion of funds provided by creditors(debt) and owners(equity). 7/ Indicates whether or not the use of financial leverage is beneficial. 8/ Measures the ability of farm sector management to realize an adequate return on the capital invested by the owner(s). 9/ Measures how efficiently managers use farm assets. 10/ The profit margin indicates profits earned per dollar of gross income. 11/ Gives the portion of gross cash farm income absorbed by production expenses (claims on farm businesses). 12/ Gives the proportion of gross cash farm income committed to interest payments. 13/ Measures the gross farm income generated per dollar of farm business assets. 14/ Indicates the burden placed on net cash farm income to retire outstanding debt.

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